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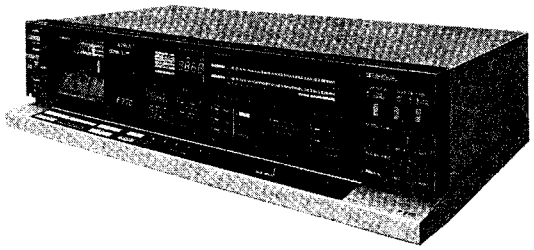
# AIWA®
# SERVICE MANUAL

MODEL NO.

STEREO CASSETTE DECK **AD-F770**

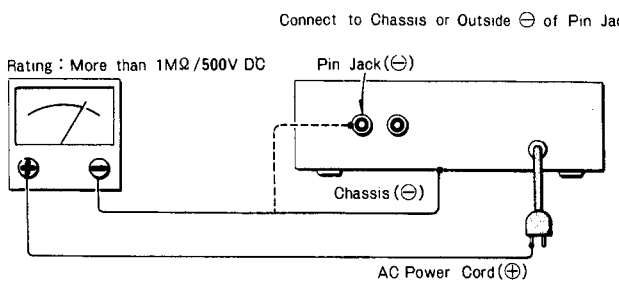


## TYPE. H,HU,U,E,K,G

**Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of serivce.**

1. **No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.**
2. **No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.**
3. **When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.**
4. **The following matters shall be maintained as they are, when repairing.**
   1) Soldering of lead-wire ends
      * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
   2) Wiring and holding of lead-wires with wire-clips and binders
   3) Materials of lead-wires
      * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
   4) Location of all kinds of insulators
   5) Setting of voltage selector switch
      * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. **After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.**

   Measuring Point




6. **General instructions for mechanism repair**
   1) The heads, capstan and pinch roller shall be cleaned of good quality alcohol after repaired, because dirty heads shall cause distorted sounds while dirty capstan and pinch roller shall occur wow/flutter and take-up fault.
   2) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
   3) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the idlers and pinch roller, especially.
   4) E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. — No re-utilization due to unreliability.
   5) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, mulfunction and damage.

# SPECIFICATIONS

**Semiconductors:** 37ICs, 91 transistors, 1 FET
87 diodes, 19 LED's

**Power supply:** H, HU models
AC 120V/220V/240V
switchable 50/60 Hz
U model
AC 120V, 50/60 Hz
E model
AC 220V, 50/60 Hz
K, G models
AC 240V, 50/60 Hz

**Power consumption:** 33W

**Dimensions:** 420(W) x 110(H) x 280(D) mm
[16–1/2" x 4–3/8" x 11–1/4"]

**Weight:** 5.5 kg (12.11 lbs)

**Track type:** 4 tracks 2 channels

**Tape speed:** 4.8 cm/s (1–7/8 ips) ± 1.5%

**Wow an flutter:** 0.025% (WRMS)
According to DIN 45500 0.09%

**Automatic stop system:** Full auto stop

**Automatic shut-off action time:**
3 ± 1s.

**Pinch roller pressure:** T side: 350 ± 30 g (3.43 ± 0.29N)
S side: 165 ± 15 g (1.61 ± 0.15N)

**Take-up torque:** 38 ± 10 g-cm (0.37 ± 0.11 mN·m)

**FF & rewind torque:** $150\ ^{+40}_{-30}$ g-cm ($1.47\ ^{+0.39}_{-0.29}$ mN·m)

**FF & rewind time:** 60 ±10s. (C-60)

**Counter indication error:** 0 ± 3 digit (C-60)

**Cassette lid action time:** 0.8 ± 0.4s. (at normal temperature)

**Playback output:** 540 ± 50 mV
(TTA-161)

**REC/PB output:** 380 mV
(27 kΩ, 0VU)

**REC/PB distortion:** Less than 1.3% (METAL)
Less than 1.3% ($CrO_2$)
Less than 1.3% (NORMAL)

**Playback noise:** Less than 2.7 mV
(Unweighted) (NORMAL DOLBY NR OFF)
Less than 1.5 mV
(NORMAL DOLBY NR B)
Less than 1.2 mV
(NORMAL DOLBY NR C)
Less than 2.0 mV
(METAL, $CrO_2$, DOLBY NR OFF)
Less than 1.2 mV
(METAL, $CrO_2$, DOLBY NR B)
Less than 1.0 mV
(METAL, $CrO_2$, DOLBY NR C)

(WTD-A) Less than 1.2 mV
(NORMAL DOLBY NR OFF)
Less than 0.6 mV
(NORMAL DOLBY NR B)
Less than 0.6 mV
(NORMAL DOLBY NR C)
Less than 1.0 mV
(METAL, $CrO_2$, DOLBY NR OFF)
Less than 0.5 mV
(METAL, $CrO_2$, DOLBY NR B)
Less than 0.5 mV
(METAL, $CrO_2$, DOLBY NR C)

**REC/PB SN ratio:** (400 Hz, 0VU)
(Unweighted) More than 44/47 dB
(METAL, $CrO_2$, DOLBY-NR B OFF/ON)
More than 42/45 dB
(NORMAL, DOLBY-NR B OFF/ON)
More than 44/49 dB
(METAL, $CrO_2$, DOLBY-NR C OFF/ON)
More than 42/48 dB
(NORMAL, DOLBY-NR C OFF/ON)
More than 48/57 dB
(METAL, DOLBY-NR B OFF/ON)
More than 50/59 dB
($CrO_2$, DOLBY-NR B OFF/ON)
More than 46/55 dB
(NORMAL, DOLBY-NR B OFF/ON)
More than 48/64 dB
(METAL, DOLBY-NR C OFF/ON)
More than 50/60 dB
($CrO_2$, DOLBY-NR C OFF/ON)
More than 46/60 dB
(NORMAL, DOLBY-NR C OFF/ON)

**Channel separation:** More than 30 dB
(1 kHz, 0VU)

**Cross talk:** More than 60 dB
(1 kHz, 0VU)

**Erasing ratio:** More than 60 dB
(125 Hz, 0VU + 10 dB, METAL)

**Level drift:** ± 0.5 dB
(10 kHz)

**Level indication error:** (–20VU) ± 5 dB
(–10VU) ± 3 dB
( –0VU) ± 1 dB
(+2 ~ +6VU) ± 2 dB
(+8 ~ +10VU) ± 2 dB

**ADMS time:** 2.0 ± 0.5s. (POWER ON)
(ADMS LED light up time)

**Bias frequency:** 85 kHz

**Frequency response:** (0 dB Rec. DOLBY NR C ON)
METAL : 20 ~ 20,000 Hz ± 3 dB
(–20 dB Rec.)
20 ~ 17,000 Hz ± 3 dB
(0 dB Rec.)
$CrO_2$ : 20 ~ 19,000 Hz ± 3 dB
(–20 dB Rec.)
20 ~ 14,000 Hz ± 3 dB
(0 dB Rec.)
NORMAL : 20 ~ 18,000 Hz ± 3 dB
(–20 dB Rec.)
20 ~ 11,000 Hz ± 3 dB
(0 dB Rec.)

**DOLBY-NR Effect:** More than 8 dB
(10 kHz, CCIR FILTER) (DOLBY NR B-type)
More than 16 dB
(DOLBY NR C-type)

**Motor:** DC Servomotor for capstan
DC motor for reels

**Head:** DX Combination head (for REC/PB)
Double gab semdust head (for erase)

**Inputs:** MIC maximum input sensitivity:
0.3 mV (200 Ω – 10 kΩ matched)
LINE IN maximum input
Sensitivity: 50 mV (more than 50 kΩ)

**Outputs:** LINE OUT/PLAY standard output level:
0.38V (0VU); suitable load
impedance: more than 50 kΩ;
Headphones: 8 Ω

**Test tape:** METAL TTA-119MX
NORMAL TTA-119J
$CrO_2$ TTA-119G

- Specifications and external appearance are subject to change without due to product improvement.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the DD symbol are trademarks of Dolby laboratories Licensing Corporation.
- HX professional originated by BANG & OLFSEN.

**As to the disassembling instructions, refer to the service manual of AD-F660.**

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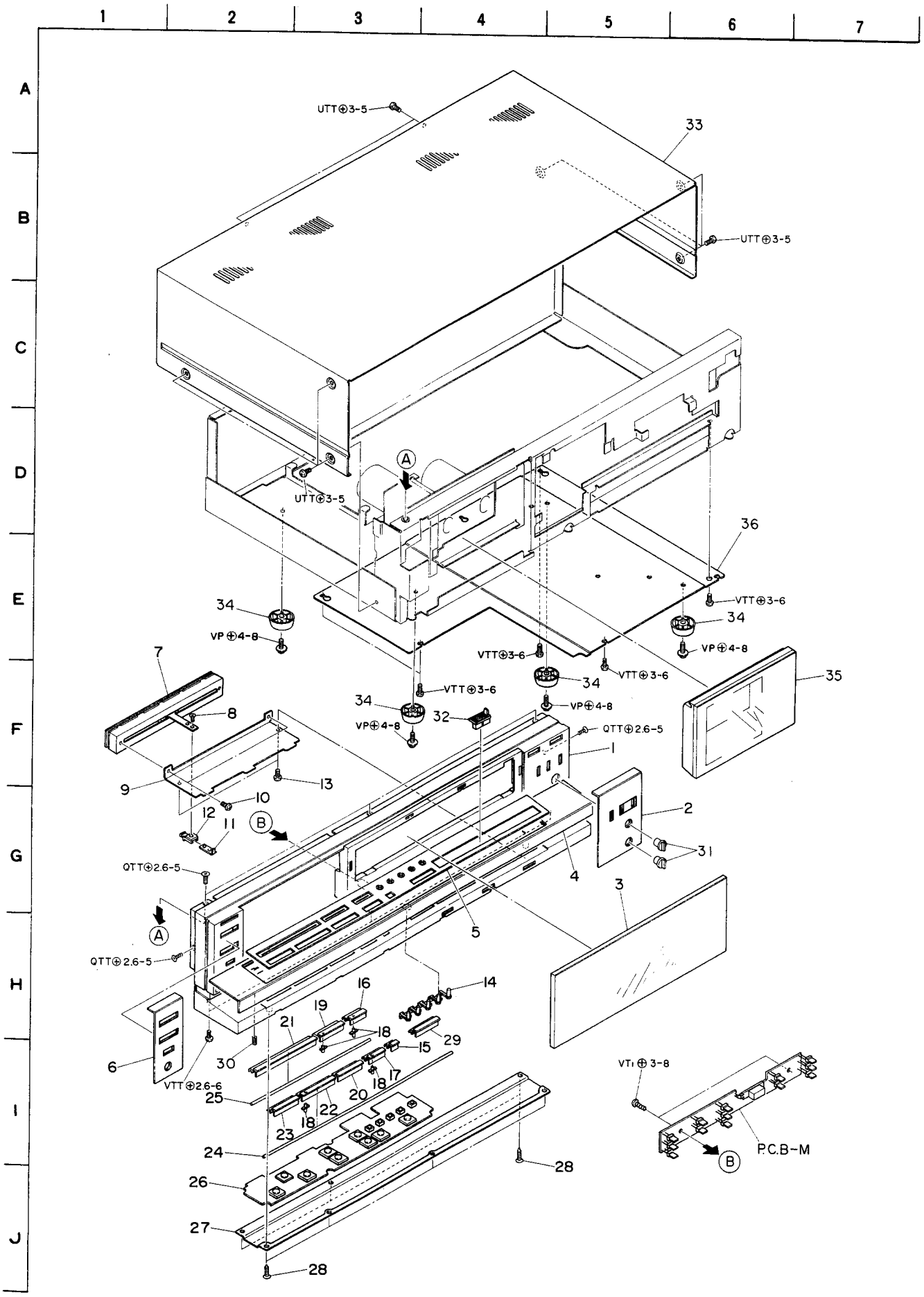
# EXPLODED VIEW-1



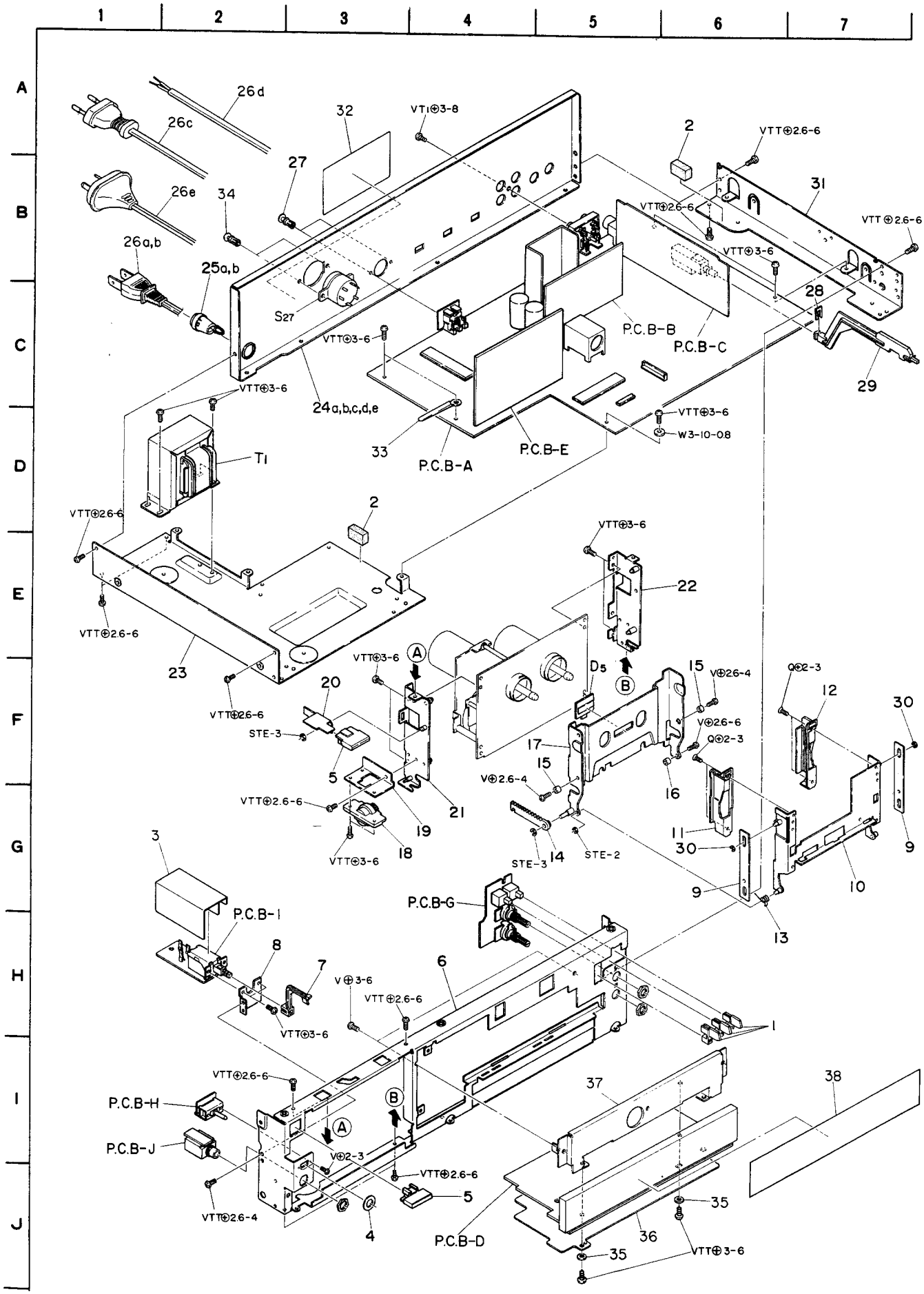
# PARTS LIST

## MECHANICAL PARTS

■ * mark in this part list shows exclusive part

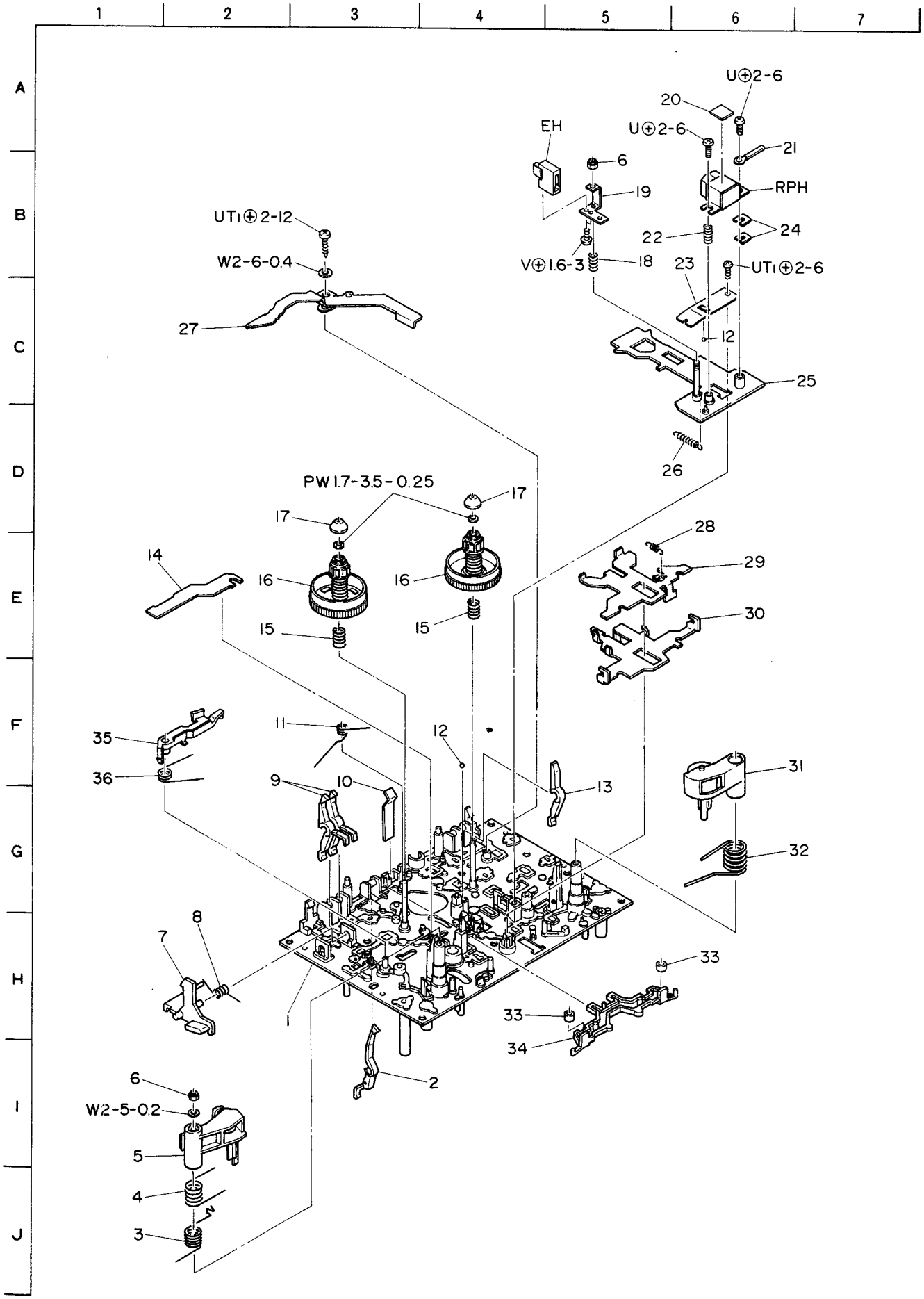
| Ref. No. | Part No. | Parts No. Changed to | Description | Common Model | Q'ty | |
|---|---|---|---|---|---|---|
| **1~30** | **82-191-025-21** | | **Front cabinet ass'y** | * | **1** | |
| 1-1 | 82-191-007-21 | | Cabinet, Front | * | 1 | |
| 1-2 | 82-191-005-01 | | Panel, Front | * | 1 | |
| 1-3 | 82-191-028-01 | | Window, Meter | * | 1 | |
| 1-4 | 82-191-020-11 | | Panel, Control | * | 1 | |
| 1-5 | 82-191-029-11 | | Panel, Control | * | 1 | |
| 1-6 | 82-188-003-01 | | Panel L, Front | | 1 | |
| 1-7 | 82-191-640-11 | | Volume SL ass'y | * | 1 | |
| 1-8 | 87-231-033-21 | | Q+2—4 | | 1 | |
| 1-9 | 82-191-006-11 | | Holder, REC volume | * | 1 | |
| 1-10 | 87-261-092-21 | | V+3—4 | | 2 | |
| 1-11 | 82-191-201-01 | | Slide lever | * | 1 | |
| 1-12 | 82-190-203-01 | | Slider,Volume | AD-F660 | 1 | |
| 1-13 | 87-321-074-21 | | $QT_1$+2.6—8 | | 2 | |
| 1-14 | 82-188-034-11 | | Touch-key, Counter | | 1 | |
| 1-15 | 82-188-045-11 | | Touch-key, MS | | 1 | |
| 1-16 | 82-188-020-01 | | Touch-key, REC MUTE | | 1 | |
| 1-17 | 82-188-019-01 | | Touch-key, REC | | 1 | |
| 1-18 | 82-188-037-01 | | Guide, Light | | 4 | |
| 1-19 | 82-188-022-01 | | Touch-key, PAUSE | | 1 | |
| 1-20 | 82-188-017-01 | | Touch-key, FF | | 1 | |
| 1-21 | 82-188-021-01 | | Touch-key, STOP | | 1 | |
| 1-22 | 82-188-016-01 | | Touch-key, PLAY | | 1 | |
| 1-23 | 82-188-018-01 | | Touch-key, REW | | 1 | |
| 1-24 | 82-188-223-01 | | Shaft A, Touch-key | | 1 | |
| 1-25 | 82-188-224-01 | | Shaft B, Touch-key | | 1 | |
| 1-26 | — — — — | | Control key A ass'y | | 1 | |
| 1-27 | 82-188-033-01 | | Cabinet A, Bottom | | 1 | |
| 1-28 | 87-326-073-01 | | $QT_1$+2.6—6 | | 7 | |
| 1-29 | 82-188-023-01 | | Touch-key CB | | 1 | |
| 1-30 | 82-190-215-01 | | C-spring, Earth | AD-F660 | 1 | |
| 1-31 | 82-184-034-01 | | Knob | FX-100 | 2 | |
| 1-32 | 82-191-003-01 | | Knob, REC volume | * | 1 | |
| 1-33 | 82-191-027-01 | | Cabinet, Steel | * | 1 | |
| 1-34 | 87-085-161-01 | | Foot | | 4 | |
| 1-35 | 82-190-021-01 | | Cassette window ass'y | AD-F660 | 1 | |
| 1-36 | 82-188-056-01 | | Cabinet, Bottom | | 1 | |

# EXPLODED VIEW-2



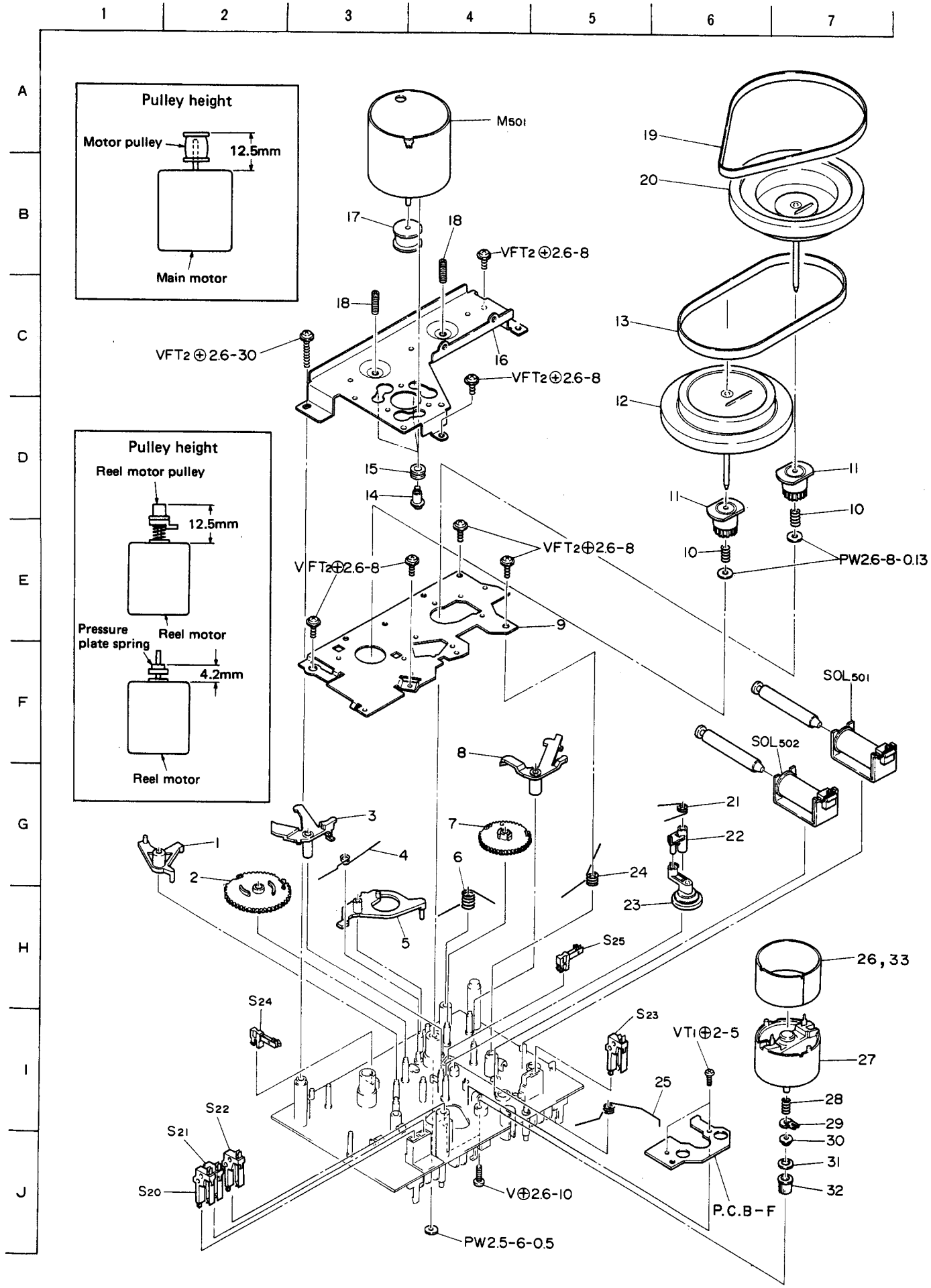
| Ref. No. | Part No. | Parts No. changed to | Description | Common Model | Q'ty |
|---|---|---|---|---|---|
| 2-1 | 82-191-001-01 | | Knob, TAPE/SOURCE | * | 3 |
| 2-2 | 82-190-213-01 | | Rubber cushion | AD-F660 | 2 |
| 2-3 | 82-190-217-01 | | Cover, Power (E, K models only) | AD-F660 | 1 |
| 2-4 | 82-422-073-11 | | Himeron cloth, Blind | | 1 |
| 2-5 | 82-188-012-01 | | Push-button, POWER | | 2 |
| 2-6 | 82-188-201-01 | | Front chassis | | 1 |
| 2-7 | 82-757-210-01 | | Rod | ST-RIO | 1 |
| 2-8 | 82-162-215-01 | | Holder, POWER | AD-R500 | 1 |
| 2-9 | 82-188-210-21 | | Lever C, Box | | 2 |
| 2-10 | 82-188-205-21 | | Cassette box ass'y | | 1 |
| 2-11 | 82-188-219-01 | | Holder L, Cassette | | 1 |
| 2-12 | 82-188-220-01 | | Holder R, Cassette | | 1 |
| 2-13 | 82-188-233-11 | | T-spring, OPEN | | 1 |
| 2-14 | 82-541-240-11 | | Lever, Oil-damp | TPR-950 | 1 |
| 2-15 | 82-188-229-01 | | Collar, Cassette box lever L | | 2 |
| 2-16 | 82-188-232-01 | | Collar, Cassette box lever R | | 1 |
| 2-17 | 82-188-039-11 | | Cassette plate ass'y | | 1 |
| 2-18 | 82-179-228-01 | | Oil-damper | AD-3800 | 1 |
| 2-19 | 82-188-211-01 | | Holder, Oil-damp | | 1 |
| 2-20 | 82-188-212-11 | | Plate, EJECT slide | | 1 |
| 2-21 | 82-188-213-41 | | Mechanism holder L ass'y | | 1 |
| 2-22 | 82-188-214-21 | | Mechanism holder R ass'y | | 1 |
| 2-23 | 82-188-204-01 | | Chassis L, Amp. | | 1 |
| 2-24a | 82-191-015-01 | | Panel, Rear (H, HU models only) | * | 1 |
| b | 82-191-016-01 | | Panel, Rear (U model only) | * | 1 |
| c | 82-191-017-01 | | Panel, Rear (E model only) | * | 1 |
| d | 82-191-018-01 | | Panel, Rear (K model only) | * | 1 |
| e | 82-191-019-01 | | Panel, Rear (G model only) | * | 1 |
| 2-25a | 87-085-184-01 | | Cord bushing (H, HU, U models only) | | 1 |
| b | 87-085-185-01 | | Cord bushing (E, K, G models only) | | 1 |
| 2-26a | 87-034-958-01 | | AC power cord (H, HU models only) | | 1 |
| b | 87-034-574-01 | | AC power cord (U model only) | | 1 |
| c | 87-034-877-01 | | AC power cord (E model only) | | 1 |
| d | 87-034-975-01 | | AC power cord (K model only) | | 1 |
| e | 87-034-892-01 | | AC power cord (G model only) | | 1 |
| 2-27 | 87-084-078-01 | | Nylon rivet 3–4.5 | | 2 |
| 2-28 | 82-385-383-11 | | Stopper, Rod | | 1 |
| 2-29 | 82-309-208-21 | | Rod, Selecter | | 1 |
| 2-30 | 82-190-206-01 | | STE-2 (Black) | AD-F660 | 2 |
| 2-31 | 82-188-209-01 | | Chassis R, Amp. | | 1 |
| 2-32 | 82-191-023-01 | | Name plate, Spec. (U model only) | * | 1 |
| 2-33 | 87-038-039-01 | | Wire binder | | 1 |
| 2-34 | 87-084-063-01 | | Nylon rivet 3–5.5 (H, HU models only) | | 2 |
| 2-35 | 82-191-203-01 | | Spacer | * | 2 |
| 2-36 | 82-188-239-01 | | FL shield sheet | | 1 |
| 2-37 | 82-188-218-01 | | FL holder | | 1 |
| 2-38 | 82-191-204-01 | | Filter | * | 1 |

# EXPLODED VIEW-3



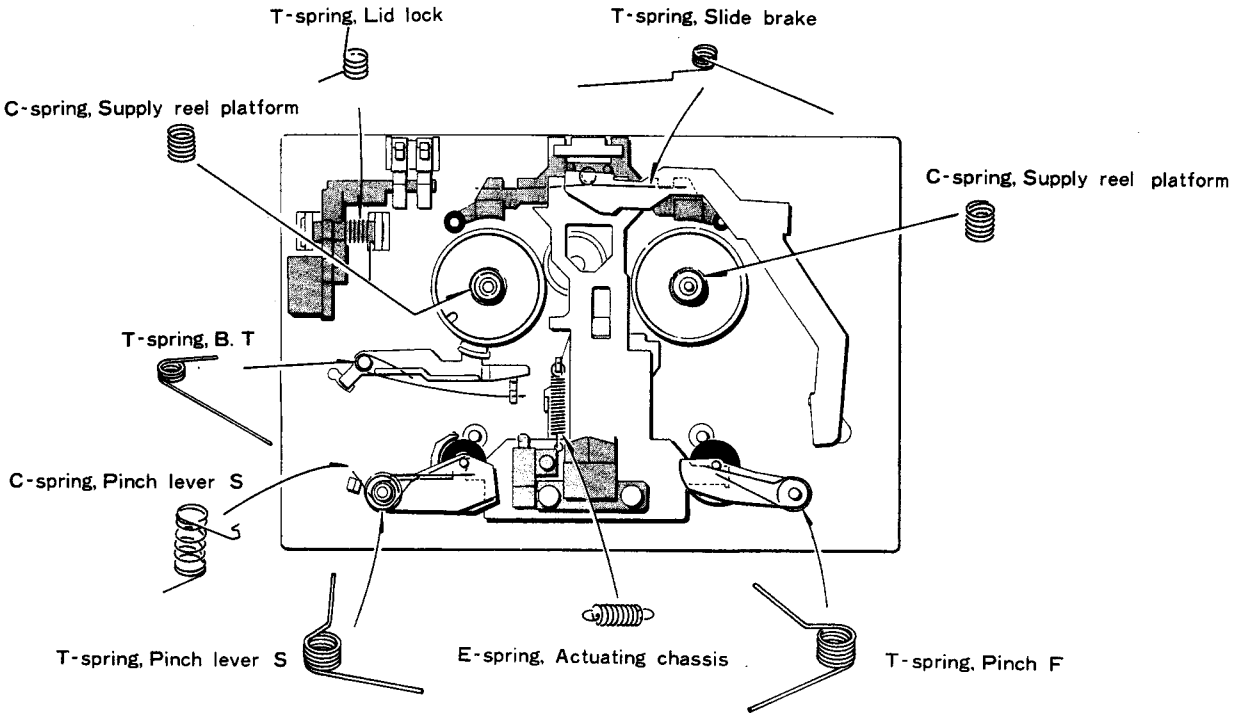
| Ref. No. | Part No. | Parts No. Changed to | Description | Common Model | Q'ty | |
|---|---|---|---|---|---|---|
| 3-1 | 81-507-201-11 | | Outsert chassis ass'y | | 1 | |
| 3-2 | 81-505-242-11 | | Lever, Metal | | 1 | |
| 3-3 | 81-507-228-01 | | C-spring, Pinch lever S | | 1 | |
| 3-4 | 81-507-217-11 | | T-spring, Pinch lever S | | 1 | |
| 3-5 | 81-507-207-11 | | Pinch lever S ass'y | | 1 | |
| 3-6 | 87-081-963-01 | | Nylon nut M2—3.5 | | 2 | |
| 3-7 | 81-505-239-01 | | Lever, Eject | | 1 | |
| 3-8 | 81-505-273-01 | | T-spring, Lid lock | | 1 | |
| 3-9 | 81-505-241-21 | | REC blocking lever | | 2 | |
| 3-10 | 81-505-260-01 | | P-spring, Pressure cassette | | 1 | |
| 3-11 | 81-505-268-01 | | T-spring, Slide brake | | 1 | |
| 3-12 | 87-073-005-01 | | Steel ball 2$\phi$ | | 2 | |
| 3-13 | 81-505-240-21 | | Lever, Cassette sensor | | 1 | |
| 3-14 | 81-505-238-01 | | Blocking plate, EJECT | | 1 | |
| 3-15 | 81-507-219-01 | | C-spring, Supply reel platform | | 2 | |
| 3-16 | 81-505-226-11 | | Take-up reel platform ass'y | | 2 | |
| 3-17 | 82-303-298-01 | | Cap, Take-up reel platform | | 2 | |
| 3-18 | 82-565-360-01 | | C-spring, EH | | 1 | |
| 3-19 | 81-507-215-01 | | Holder, EH | | 1 | |
| 3-20 | 87-057-620-01 | | Label, Head | | 1 | |
| 3-21 | 87-038-056-01 | | Wire binder | | 1 | |
| 3-22 | 82-307-212-01 | | C-spring, EH | | 1 | |
| 3-23 | 81-507-224-01 | | P-spring, Actuating chassis | | 1 | |
| 3-24 | 81-507-227-01 | | Spacer | | 2 | |
| 3-25 | 81-507-214-21 | | Actuating chassis ass'y | | 1 | |
| 3-26 | 81-505-265-11 | | E-spring, Actuating chassis | | 1 | |
| 3-27 | 81-505-307-01 | | Lever, Brake eject | | 1 | |
| 3-28 | 81-505-266-01 | | E-spring, PAUSE plate | | 1 | |
| 3-29 | 81-505-207-01 | | Plate, PAUSE | | 1 | |
| 3-30 | 81-507-220-01 | | Plate, Pinch lever | | 1 | |
| 3-31 | 81-505-210-11 | | Pinch lever F ass'y | | 1 | |
| 3-32 | 81-505-267-01 | | T-spring, Pinch F | | 1 | |
| 3-33 | 81-507-229-01 | | G brake | | 2 | |
| 3-34 | 81-505-236-11 | | Lever, Slide brake | | 1 | |
| 3-35 | 81-507-222-01 | | Lever, Back tension | | 1 | |
| 3-36 | 81-507-223-01 | | T-spring, B.T | | 1 | |

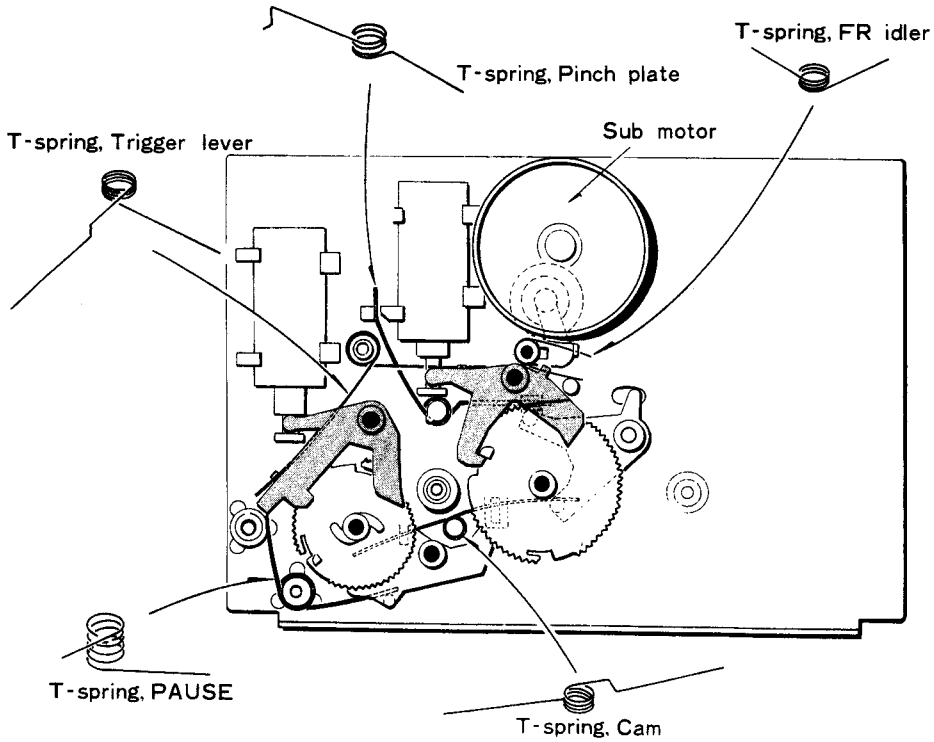
# EXPLODED VIEW-4



| Ref. No. | Part No. | Parts No. Changed to | Description | Common Model | Q'ty | |
|---|---|---|---|---|---|---|
| 4-1 | 81-505-230-01 | | Lever, PLAY | | 1 | |
| 4-2 | 81-505-234-01 | | Gear, PLAY cam | | 1 | |
| 4-3 | 81-505-231-01 | | Trigger lever, PLAY | | 1 | |
| 4-4 | 81-505-272-01 | | T-spring, Cam | | 1 | |
| 4-5 | 81-505-308-01 | | Lever B, PAUSE | | 1 | |
| 4-6 | 81-505-283-01 | | T-spring, PAUSE lever | | 1 | |
| 4-7 | 81-505-235-01 | | Gear, PAUSE cam | | 1 | |
| 4-8 | 81-505-233-01 | | Trigger lever, PAUSE | | 1 | |
| 4-9 | 81-505-204-01 | | Chassis B, Mechanism | | 1 | |
| 4-10 | 81-505-261-01 | | C-spring, Flywheel F | | 2 | |
| 4-11 | 81-505-225-01 | | Gear, Flywheel | | 2 | |
| 4-12 | 81-507-205-01 | | Flywheel S ass'y | | 1 | |
| 4-13 | 81-507-225-01 | | Rubber belt B | | 1 | |
| 4-14 | 87-081-483-01 | | Motor screw, M2.6 | | 3 | |
| 4-15 | 87-087-029-01 | | Rubber cushion | | 3 | |
| 4-16 | 81-507-221-01 | | Holder, Motor | | 1 | |
| 4-17 | 81-505-245-01 | | Motor pulley 2-10-6.8 | | 1 | |
| 4-18 | 82-565-373-01 | | Screw, Thrust | | 2 | |
| 4-19 | 81-507-216-01 | | Rubber belt A | | 1 | |
| 4-20 | 81-507-203-31 | | Flywheel T ass'y | | 1 | |
| 4-21 | 81-505-282-01 | | T-spring, FR idler | | 1 | |
| 4-22 | 81-505-254-01 | | Lever A, FR idler | | 1 | |
| 4-23 | 81-505-250-21 | | FR idler ass'y | | 1 | |
| 4-24 | 81-505-271-01 | | T-spring, Trigger lever | | 1 | |
| 4-25 | 81-505-269-01 | | T-spring, Pinch plate | | 1 | |
| **26~33** | **09-011-038-01** | | **Reel motor ass'y** | | **1** | |
| 4-26 | 81-505-606-01 | | Shield plate | | 1 | |
| 4-27 | 81-505-604-11 | | Motor, Reel | | 1 | |
| 4-28 | 81-505-290-01 | | C-spring, FR idler C | | 1 | |
| 4-29 | 81-505-287-11 | | Lever C, FR idler | | 1 | |
| 4-30 | 81-505-289-01 | | Pressure plate spring | | 1 | |
| 4-31 | 81-505-292-11 | | Felt 4.5–7.2–0.8 | | 1 | |
| 4-32 | 81-505-320-01 | | Pulley, Reel motor | | 1 | |
| 4-33 | 81-505-608-01 | | Shield plate B | | 1 | |

# SPRING APPLICATION POSITION



## Circuit description

### 1. Outline (Logic)

This controller is composed of three 4-bit microcomputers combined with the deck's mechanism logic controller with the dual capstan CUE, REV feature, the electronic counter controller including the remaining tape meter and the compu-brain controller.

### 2. Controller and peripheral circuit diagram

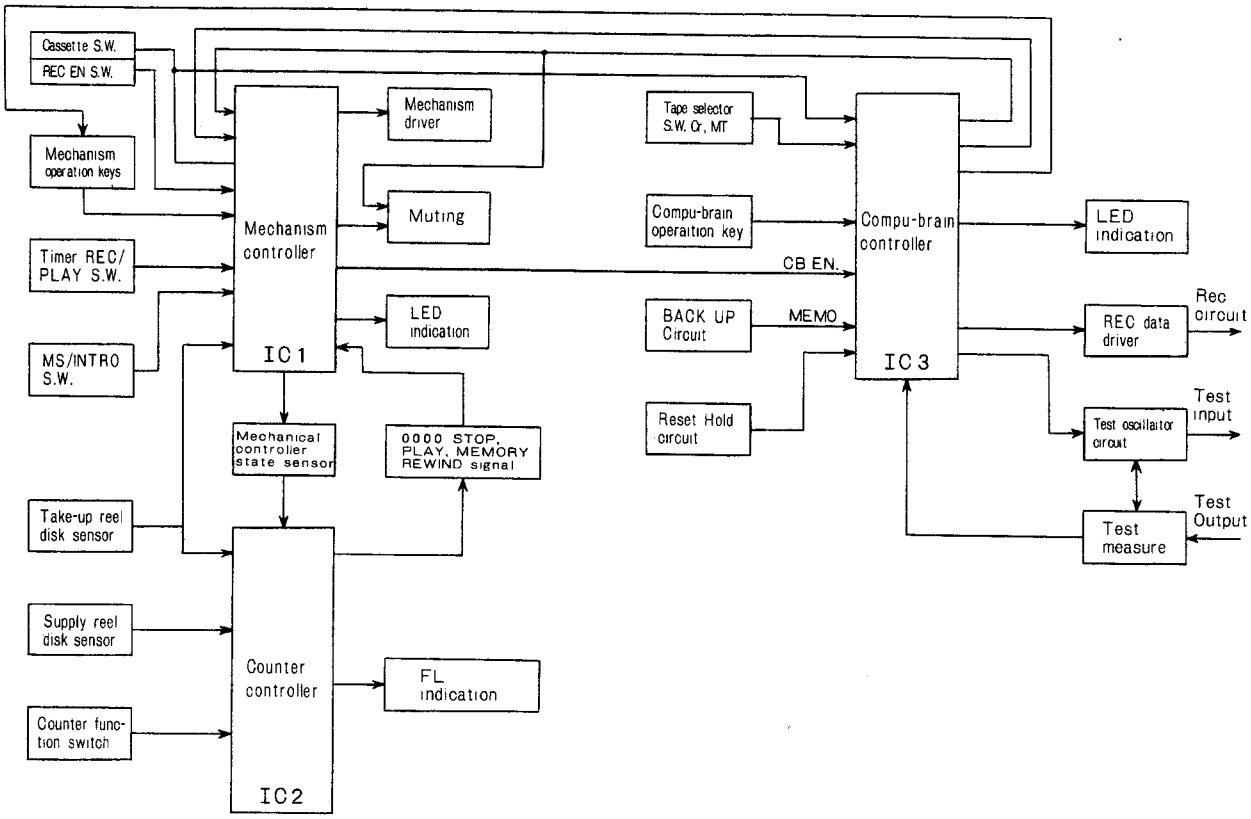



Fig-1

### 3. Mechanism controller specifications

#### 3-1. General specifications

**3-1-1. STOP, PLAY, RWD, FF, REC, PLAY/PAUSE:** Same as the general controller

**3-1-2. CUE, REVIEW:** Possible by pressing the PLAY key and FF (or RWD) key together.

**3-1-3. ONE TOUCH REC:** It is set to the REC/PLAY-PAUSE mode by pressing only the REC key in the PAUSE mode.

**3-1-4. TIMER-REC/PLAY:** Same as the general specifications

**3-1-5. Counter 0000 STOP/PLAY, MEMORY-REWIND:** This cannot be operated when the remaining tape is displayed. This does not operate during the REC, MS, INTRO-PLAY operations.

**3-1-6. REC-MUT-TIMER (1):** The unit automatically enters the REC/PLAY-PAUSE mode 4 sec after the REC-MUT KEY is pressed and released. This makes it easy to leave non-recorded sections for MS operation.

**3-1-7. REC-MUT-TIMER (2):** When the key is pressed continuously to leave a non-recorded section for 4 sec or more, the LED blinks every 1 sec.

**3-1-8. REC-MUTE:** When the REC-MUT KEY is pressed again within 4 sec after it is first pressed, the REC-MUT mode is released.

**3-1-9. Tape slack prevention:** When the cassette tape is loaded, rewind operation is done for one pulse from the take-up reel disk to remove slack tape.

**3-1-10. ADMS:** The head is automatically demagnetized when power is switched ON.

## 3-2. Additional functions

**3-2-1. MS:** Same as general specifications

**3-2-2. INTRO PLAY:** By setting to CUE or REV with INTRO PLAY ON, it plays the first 8 seconds of each tune.

**3-2-3. Controller timing:** The control timing and muting timing of the mechanism are taken into consideration, so a special peripheral time constant circuit is not required.

## 3-3. Description of microcomputer terminal

### 3-3-1. Terminal name

**IC-1 [μPD546C-357]**

Direction of arrow shows the signal flow.

**Fig-2**

### 3-3-2. Terminal functions

**"H": High level, 5V**
**"L": Low level, 0 or −5V**

| Pin No. | Terminal symbol | Function |
|---|---|---|
| ① ㊷ | CL (1) CL (2) | The clock receives only 400 kHz |
| ② | I · Fφ | Terminal to inhibit ME.RWD during REC. Set to "L" from "H" when the RWD command is input from the microcomputer. |
| ③ | I · RECEN | The terminal is set to "L" and recoeding is not done when the safety tab is broken off. |
| ④ | I · MUS | Signal input during INTRO PLAY and MS. Set to "H" for tunes and to "L" between tunes. |
| ⑤ | I · ISW | Switch to select the INTRO PLAY and MS. Repeats OFF → INTRO PLAY → MS → OFF. |
| ⑥ | I · RTP | Inputs the pulse from the takeup reel disk sensor. For AUTOSTOP. |
| ⑦ | RST | RESET terminal. Set to "H" instantaneously when power is switched ON; also set to "H" instantaneously when power is switched OFF. Set to "L" in general. |
| ⑧ ⑨ | T · PL T · REC | Set to "H" during timer play and recording. Set to "L" during OFF. |
| ⑩ | I·CBKY | KEY REQUEST from the compu-brain. The REC/PLAY, FF and REW keys can be accepted when this pin is set to Hi. |
| ⑪ | I·LMT | Input from the compu-brain.Set to Hi during the compu-brain mode. Reads the counter during compu-brain operation. |
| ⑫ | O·CBEN | Outputs Hi when the compu-brain operation is possible (when the mechanism is in the STOP mode and recording is possible). |
| ⑬ | O · REC | Set to "H" during recording. For erase,·bias oscillator. |
| ⑭ | O · ADMS | Set to "H" for approx. 1.5 sec during power ON. For ADMS. |
| ⑮ ⑯ ⑰ | O · RCR O · TAPE O · SOUR | Not used in F770 OPEN terminal |
| ⑱ | $\overline{\text{O · RMT}}$ | Set to "H" during recording, and "L" during REC-MUTE in recording. |
| ⑲ | $\overline{\text{O · PLMT}}$ | Set to "H" during REC/PLAY, CUE/REV to release muting. Set to "L" during INTRO PLAY, MS. |
| ⑳ | TEST | Connect tó +5V. |
| ㉒ ~ ㉕ | D−. . . | Indication output. Set to "H" during operation. |
| ㉖ | O−FF | Set to "H" during FF, CUE. |
| ㉘ | S-PAUS | Set to "H" during PAUSE, FF/REW CUE/REV. |
| ㉙ | S-PLAY | Set to "H" during PLAY/REC, CUE/REV. |
| ㉚ | O−RWD | Set to "H" during RWD/REV. |
| ㉛ | O−FWD | Set to "H" during REC/PLAY/ FF/CUE. |
| ㉜ | O−M−LOW | Set to "H" during PLAY, REC/ PLAY. |
| ㉝ ~ ㊵ | K−. . . | Key input. Set to "H" in general. Accepts key input when changed to "L" from "H" |

**Table-1**

## 3-4. Description of solenoid circuit

**3-4-1 Description of PLAY solenoid**

1 S24 is set to OFF during the stop mode and when S-PLAY of the microcomputer is set to Hi, IC5 3/7 is set to ON and pin 14 , Lo, so SOL502 is pulled. When SOL502 is pulled, the gear PLAY cam rotates and S24 enters the ON region.
S-PLAY is set to Hi, so IC5 1/7 is set to ON, pin 16 Lo, and simultaneously when S24 is set to ON, IC5 3/7 is set to OFF.
The gear PLAY cam continues turning when SOL502 is set to OFF, and stops at the PLAY position.

2 When the S-PLAY pin is set to Hi → Lo, IC5 1/7 is set to OFF, current flows via R30, S24, IC5 3/7 is set to ON and SOL502 is set to ON again. Then, the gear PLAY cam turns again and SOL502 is set to OFF when S24 enters the OFF region. The gear PLAY cam turns to the STOP position after SOL502 is set to OFF.

**3-4-2. Description of PAUSE solenoid:** The operation is same as that of the PLAY solenoid mechanism.
The PAUSE operation also works to release braking applied to the reel disk, so SOL501 is set to ON during FF.RWD other than during PAUSE.

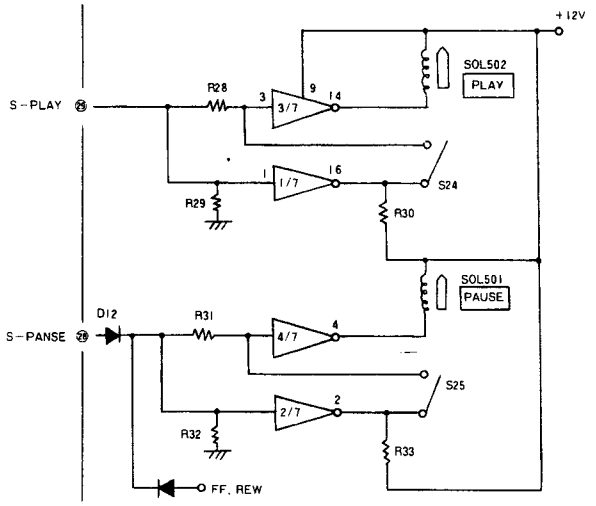
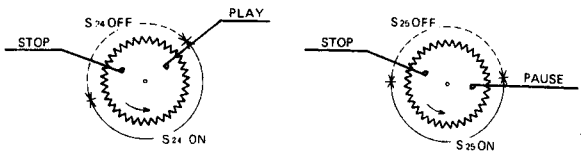



Fig-3



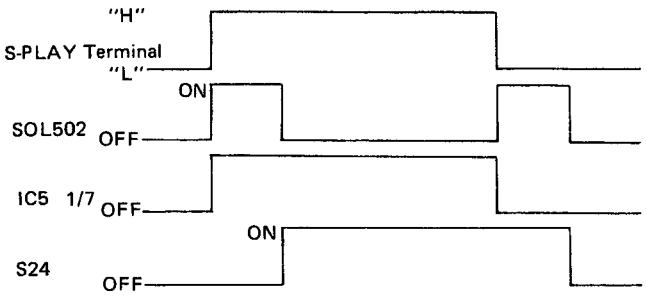




Fig-4

## 4. Counter controller specifications

### 4-1. Counter function

**4-1-1.** Addition and subtraction are same as with a general counter. However, when the eject operation is done, it is reset.

**4-1-2. MEMORY-RWD function:** 0000-STOP, REPLAY function is processed via this microcomputer and commands are transmitted to the controller.

### 4-2. Remaining tape function

**4-2-1.** The remaining tape is indicated in minute/second units during play/recording. When the unit enters the STOP and PAUSE modes while the remaining tape is displayed, the display is held.

**4-2-2.** When the unit enters the FF/RWD modes during minute/second indication, the residual amount time is indicated in minute units.

### 4-3. FL indication functions

**4-3-1.** The counter controller can be connected directly to the FL grid and plate and all the indication terminals are pulled down to —V—DIFP inside the microcomputer.

## 4-4. Description of microcomputer terminal

### 4-4-1. Terminal name

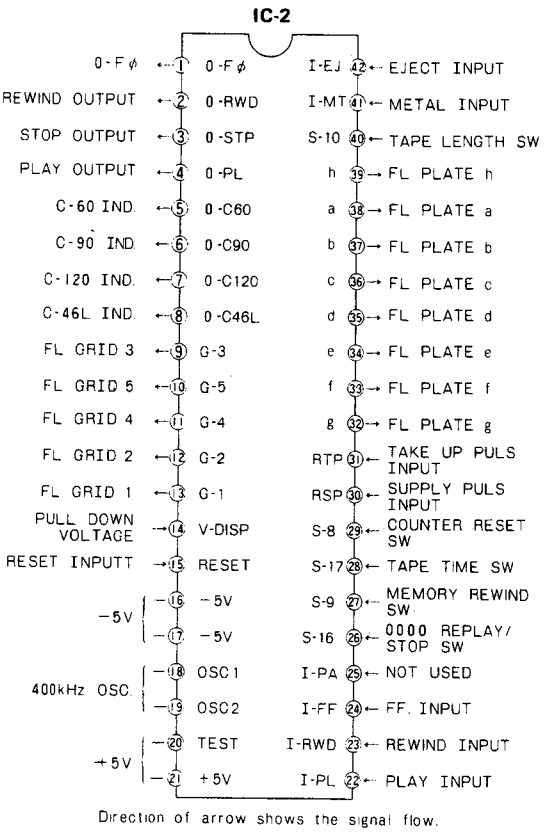

IC-2
0-Fφ ← 1 0-Fφ
REWIND OUTPUT ← 2 0-RWD
STOP OUTPUT ← 3 0-STP
PLAY OUTPUT ← 4 0-PL
C-60 IND. ← 5 0-C60
C-90 IND. ← 6 0-C90
C-120 IND. ← 7 0-C120
C-46L IND. ← 8 0-C46L
FL GRID 3 ← 9 G-3
FL GRID 5 ← 10 G-5
FL GRID 4 ← 11 G-4
FL GRID 2 ← 12 G-2
FL GRID 1 ← 13 G-1
PULL DOWN VOLTAGE → 14 V-DISP
RESET INPUTT → 15 RESET
−5V 16 −5V
17 −5V
400kHz OSC. 18 OSC1
19 OSC2
+5V 20 TEST
21 +5V
I-EJ 42 ← EJECT INPUT
I-MT 41 ← METAL INPUT
S-10 40 ← TAPE LENGTH SW
h 39 → FL PLATE h
a 38 → FL PLATE a
b 37 → FL PLATE b
c 36 → FL PLATE c
d 35 → FL PLATE d
e 34 → FL PLATE e
f 33 → FL PLATE f
g 32 → FL PLATE g
RTP 31 ← TAKE UP PULS INPUT
RSP 30 ← SUPPLY PULS INPUT
S-8 29 ← COUNTER RESET SW
S-17 28 ← TAPE TIME SW
S-9 27 ← MEMORY REWIND SW.
S-16 26 ← 0000 REPLAY/STOP SW
I-PA 25 ← NOT USED
I-FF 24 ← FF. INPUT
I-RWD 23 ← REWIND INPUT
I-PL 22 ← PLAY INPUT
Direction of arrow shows the signal flow.

**Fig-5**

### 4-4-2. Terminal functions

**"H": High level, +5**
**"L": Low level, 0 or −5V**

| Pin No. | Terminal symbol | Function |
|---|---|---|
| ① | 0–Fφ | This is set to "L" ingeneral and to "H" when 0–RWD, 0–STOP or 0–PL is output. This is used to discriminate between the key inputs of the mechanism controller. |
| ② | 0–RWD | "L" is output to perform memory-RWD in the counter mode. Set to "H" in general. |
| ③ | 0–STP | "L" is output to perform 0000 STOP in the counter mode. Set to "H" in general. |
| ④ | 0–PL | "L" is output to perform 0000 REPLAY in the counter mode. Set to "H" in general. |
| ⑤ ~ ⑧ | 0–C... | This is used for TAPE LENGTH indication. |
| ⑨ ~ ⑬ | G–... | Connected to the FL grid. |
| ⑭ | V-DISP | This terminal determines the internal pull-down potential. |
| ⑮ | RESET | Internal reset is possible. Reset is applied when this is connected to −5V. |
| ⑯, ⑰ | −5V | −5V |
| ⑱, ⑲ | OSC | This is 400 kHz ceramic oscillator. |
| ⑳, ㉑ | +5V | +5V |
| ㉒ | I-PL | "H" is input during play, record/play and the remaining minutes and seconds are calculated. |
| ㉓ | I-RWD | "H" is input during RWD, and the remaining tape in the RWD direction is calculated. |
| ㉔ | I-FF | "H" is input during FF and the remaining tape in the FF direction is calculated. |
| ㉖ ~ ㉙ ㊵ | S–... | Counter function input switch. Set to "L" in general, and "H" is input when the key is set to ON. |
| ㉚ | RSP | Inputs the pulse output from the supply reel disk. This is used to measure the time it takes the supply reel disk to complete 1 revolution during play. |
| ㉛ | RTP | Inputs the pulse output from the take-up reel. This is used for the counter. |
| ㉜ ~ ㉟ | a ~ h | Connected to the FL plate. |
| ㊶ | I-MT | Set to "L" in general and to "H" when METAL TAPE is used. The remaining tape is corrected for the thickness of METAL TAPE. |
| ㊷ | I-EJ | This is used to reset the counter to "0000" when the cassette is not inserted during the counter mode. The remaining amount is erased during EJECT in the remaining tape mode. |

**Table-2**

## 4-5. Description of FL (Fluorescent lamp) counter

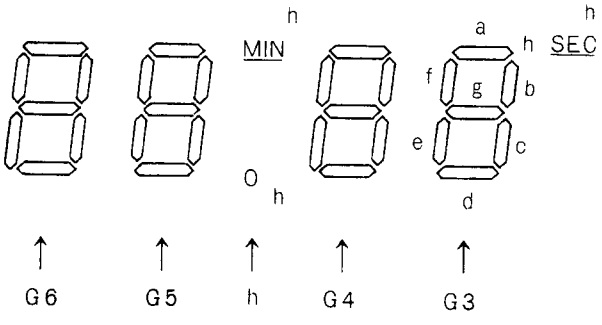



**Fig-6**

The filament voltage is approx. 1.5V. (AC50 kHz).

## 4-6. Description of indication

**4-6-1. Tape length indication**

When 5 ~ 8 are set to H, 60/46, 90, 120 or 46L light in the fluorescent display.

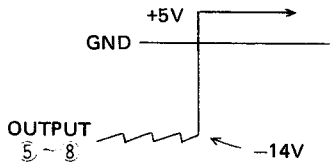



Fig-7

**4-6-2. "0000" STOP, REPLAY, MEMORY REWIND indications:**

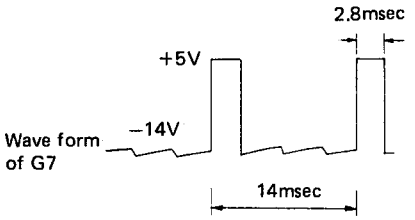



Fig-8

The current flowing to G7 is not DC current but the pulse divided by 5.

| | $G_3 \sim G_6$ "H" | $G_7$ "H" |
|---|---|---|
| a | 7segument figures | TAPE COUNTER |
| b | | "0 0 0 0" REPLAY |
| c | | "0 0 0 0" STOP |
| d | | MEMORY REWIND |
| e | | TAPE TIME |
| f | | — |
| g | | — |
| h | — | A colon is indicated TAPE TIME. |

Table 3

**4-6-3.** NORMAL, $CrO_2$ and METAL indicators light when the input is set to Hi.

**Indication imports**

**4-6-4. This circuit cancels the 0000 STOP, REPLAY and MEMORY REWIND functions during the CUE, REV, MS modes and during compu-brain.**

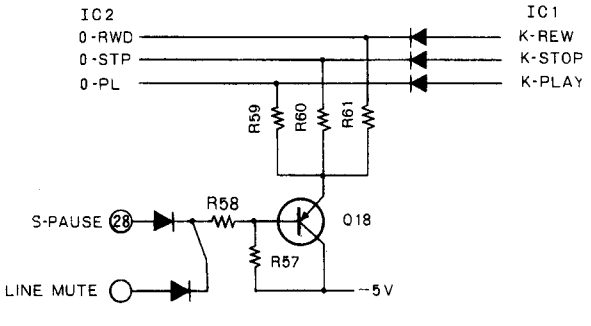



Fig-9

When the S-PAUSE or LINE MUTE is set to Hi, 3 outputs of IC2 are not pulled down, so IC1 does not accept the key input.

When S-PAUSE or LINE MUTE is set to Lo, the output of IC2 is pulled down during operation by R59 ~ 61, and IC1 accept the operation.

**IC2 terminal 22 circuit description**

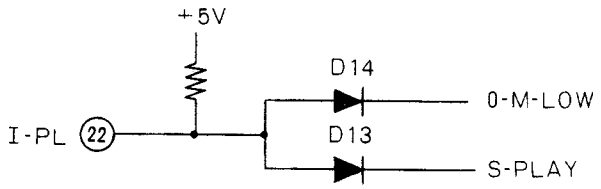



Fig-10

When S-PLAY is set to "H" and OM-LOW is also set to "H", "H" is input to I-PL.

## 5. Compu-brain specifications

### 5-1. Adjustment Item

**5-1-1. Bias adjustment:** Adjust to the bias so that the record/play sensitivities of the reference frequency (400 Hz) and the bias adjustment frequency (10 kHz) are equal.

**5-1-2. Sensitivity adjustment:** Adjust so that the record/play sensitivity at the reference frequency is set to the reference value.

**5-1-3. Equalizer adjustment:** Adjust so that the record/play sensitivity is set to the reference value at the reference frequency.

### 5-2. Number of Adjustment Steps

32 steps for all items.

### 5-3. Adjustment Method

This is a sequency of comparative feedback adjustments of the bias current, sensitivity and equalizer set as parameters.

5 bits ($32 = 2^5$) are adjusted, so it is completed with 5 cycles of comparative feedback. Adjustment is possible in 5/32 the time when compared with a sequency comparison type.

**5-3-1. Bias adjustment:** When the best point cannot be obtained in one adjustment, set the MEQ $\phi$ (MEQ 1 of pin 37 ) of IC3 pin 36 to Hi when the BIAS DATA are set to $\phi\phi\phi\phi\phi$ (when it is set to 11111), change the recording equalizer and re-adjust from the beginning.

### 5-4. Error Processing

**5-4-1.** When any error in the data occurs during adjustment which makes adjustment impossible, the tape is fast-forwarded for 1 sec and adjustment is done again. When an error occurs during the 2nd adjustment, the LED indicates this, tape is rewound and adjustment is released. (Returns to the standard data.)

### 5-5. Time Required

**5-5-1.** When no error occurs: Approx. 16 sec.

**5-5-2.** When an error occurs: it differs depending on the type of the error.

### 5-6. Interruption of Mechanism Control Key

When any mechanism control key is pressed during adjustment, the unit enters the stop mode. The compu-brain data is set to the standard data.

## 5-7. Description of microcomputer

### 5-7-1. Terminal name

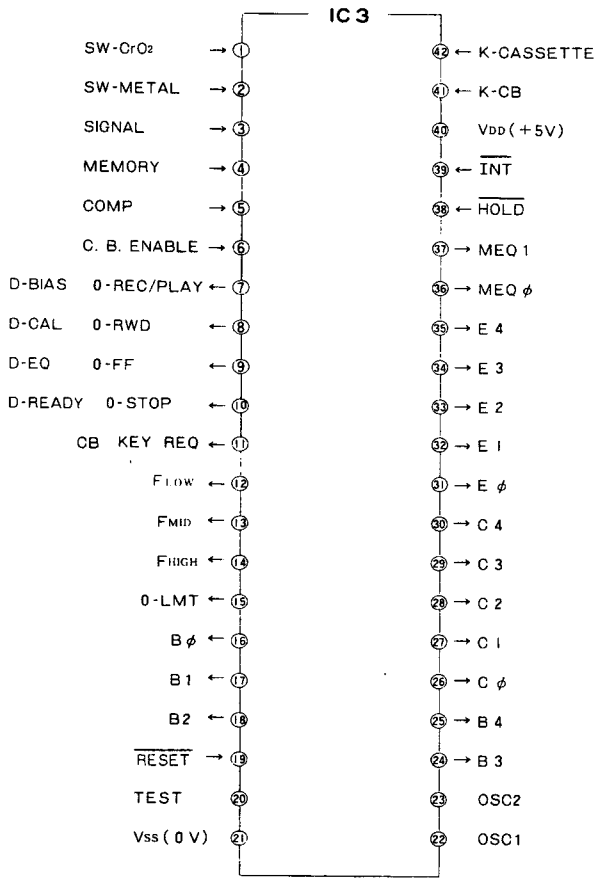
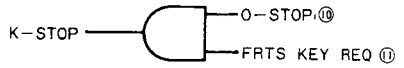



Fig-11

INPUT : K-CB "L" START/RESET
K-CASSETTE "H" CASSETT ON
SIGNAL "L" Magnetic coating provided
C.B.ENABLE "H" C.B. START possible
MEMORY "H" BACK UP ON

OUTPUT : FRTS KEY REQ. KEY REQ from "H" FRTS
MEQ φ BIAS DATA φφφφφ "H"
MEQ 1 〃 11111 "H"




### 5-7-2. Terminal functions

"H": High level 5V, "L": Low level "0V" LC6505C-609

| Pin No. | Pin mark | Function |
|---|---|---|
| ①<br>② | SW-Cr<br>SW-MT | Tape selector logic input<br>WRITE/READ of the compu-brain data to/from memory |
| ③ | SIGNAL | Record/Play signal input during the compu-brain adjustment. (Detects the magnetic coating.) "L" shows that the magnetic coating is present. |
| ④ | MEMORY | Detects presence/absence of back-up operation. Back-up is present when this pin is set to Hi: Call of compu-brain adjusted data (memory data). Back-up is not present when this pin is set to Lo: Call-up of standard data. |
| ⑤ | COMP | Comparison result input during compu-brain adjustment |
| ⑥ | CB-EN | Detects possibility of compu-brain. START is possible when this pin is set to Hi. |
| ⑦ | D-BIAS/<br>0-REC/PLAY | Pin 11 is set to Hi and REC/PB key is pressed with pin 7 set to Hi. Bias LED is lit when pin 11 is set to Lo. |
| ⑧ | C-CAL/<br>0-REW | Pin 11 is set to Hi and REW key is pressed when pin 8 is set to Hi. CAL LED is lit when pin 11 is set to Lo. |
| ⑨ | D-EQ/0-FF | Pin 11 is set to Hi and FF key is pressed when pin 9 is set to Hi. EQ LED is lit when pin 11 is set to Lo. |
| ⑩ | D-READY/<br>0-STOP | Pin 11 is set to Hi and STOP key is pressed when pin 10 is set to Hi. READY LED is lit when pin 11 is set to Lo. |
| ⑪ | KEY REQ | When this pin is set to Hi, the mechanism key is requested from the compu-brain. |
| ⑫ | OSL FL | Controls the test tone 400 Hz used during compu-brain. |
| ⑬ | OSL FM | Controls the test tone 10 kHz used during compu-brain. |
| ⑭ | OSC FH | Controls the test tone 13 kHz used during compu-brain. |
| ⑮ | $\overline{\text{0-LMT}}$ | LINE MUTE output. Hi output in general. MUTE on when this output is set to Lo. Set to Lo for approx. 2.5 sec during compu-brain or after power is set to ON. |
| ⑯ | Bφ | Compu-brain data output BIAS φ: Set to Hi when $2^0$ bit is set. |
| ⑰ | B1 | Compu-brain data output BIAS 1: Set to Hi when $2^1$ bit is set. |
| ⑱ | B2 | Compu-brain data output BIAS 2: Set to Hi when $2^2$ bit is set. |
| ㉔ | B3 | Compu-brain data output BIAS 3: Set to Hi when $2^3$ bit is set. |
| ㉕ | B4 | Compu-brain data output BIAS 4: Set to Hi when $2^4$ bit is set. |
| ⑲ | $\overline{\text{RESET}}$ | Reset pin input |
| ⑳<br>㉑ | TEST<br>Vss | Connected to the 0V power supply |

| Pin No. | Pin mark | Function |
|---|---|---|
| ㉒ | OSC1 | This pin supplies external operation clock. Inputs the mechanism control 400 Hz. |
| ㉓ | OSC2 | Internal clock oscillating pin attached to the external resonance circit. Not connected. |
| ㉖ | Cφ | Compu-brain data output CAL φ: Set to Hi when $2^0$ bit is set. |
| ㉗ | C1 | Compu-brain data output CAL 1: Set to Hi when $2^1$ bit is set. |
| ㉘ | C2 | Compu-brain data output CAL 2: Set to Hi when $2^2$ bit is set. |
| ㉙ | C3 | Compu-brain data output CAL 3: Set to Hi when $2^3$ bit is set. |
| ㉚ | C4 | Compu brain data output CAL 4: Set to Hi when $2^4$ bit is set. |
| ㉛ | E φ | Compu-brain data output EQ φ: Set to Hi when $2^0$ bit is set. |
| ㉜ | E1 | Compu-brain data output EQ 1: Set to Hi when $2^1$ bit is set. |
| ㉝ | E2 | Compu-brain data output EQ 2: Set to Hi when $2^2$ bit is set. |
| ㉞ | E3 | Compu-brain data output EQ 3: Set to Hi when $2^3$ bit is set: |
| ㉟ | E4 | Compu-brain data output EQ 4: Set to Hi when $2^4$ bit is set. |

| Pin No. | Pin mark | Function |
|---|---|---|
| ㊱ | MEQ φ | Set to Hi when B0, B1, B2, B3, B4 of the data are set to φφφφφ during bias adjustment. To change recording equalizer. |
| ㊲ | MEQ1 | Set to Hi when B0, B1, B2, B3, B4 of the data are set to 11111 during bias adjustment. To change recording equalizer. |
| ㊳ | $\overline{\text{HOLD}}$ | HOLD mode demand input pin. |
| ㊴ | $\overline{\text{INT}}$ | Interruption demand input pin. Not connected. |
| ㊵ | $V_{DD}$ | Power pin. Connected to the back-up capacitor circuit. Approx. 5.3V in general. Approx. 5.6V just after power OFF, and then gradually drops in several hours. |
| ㊶ | K-CB | Compu-brain key. Compu-brain start/reset when this is set to Lo. |
| ㊷ | K-CST | For cassette detection. Set to Hi when a cassette is present. |

**Table-4**

### 5-7-3. Logic of Tape selector

"H" 5V, "L" 0V

| | NORMAL | $CrO_2$ | Metal |
|---|---|---|---|
| SW-Cr | "H" | "L" | "L" |
| SW-MT | "H" | "H" | "L" |

**Table-5**

## 5-8. Compu-brain Peripheral Circuit

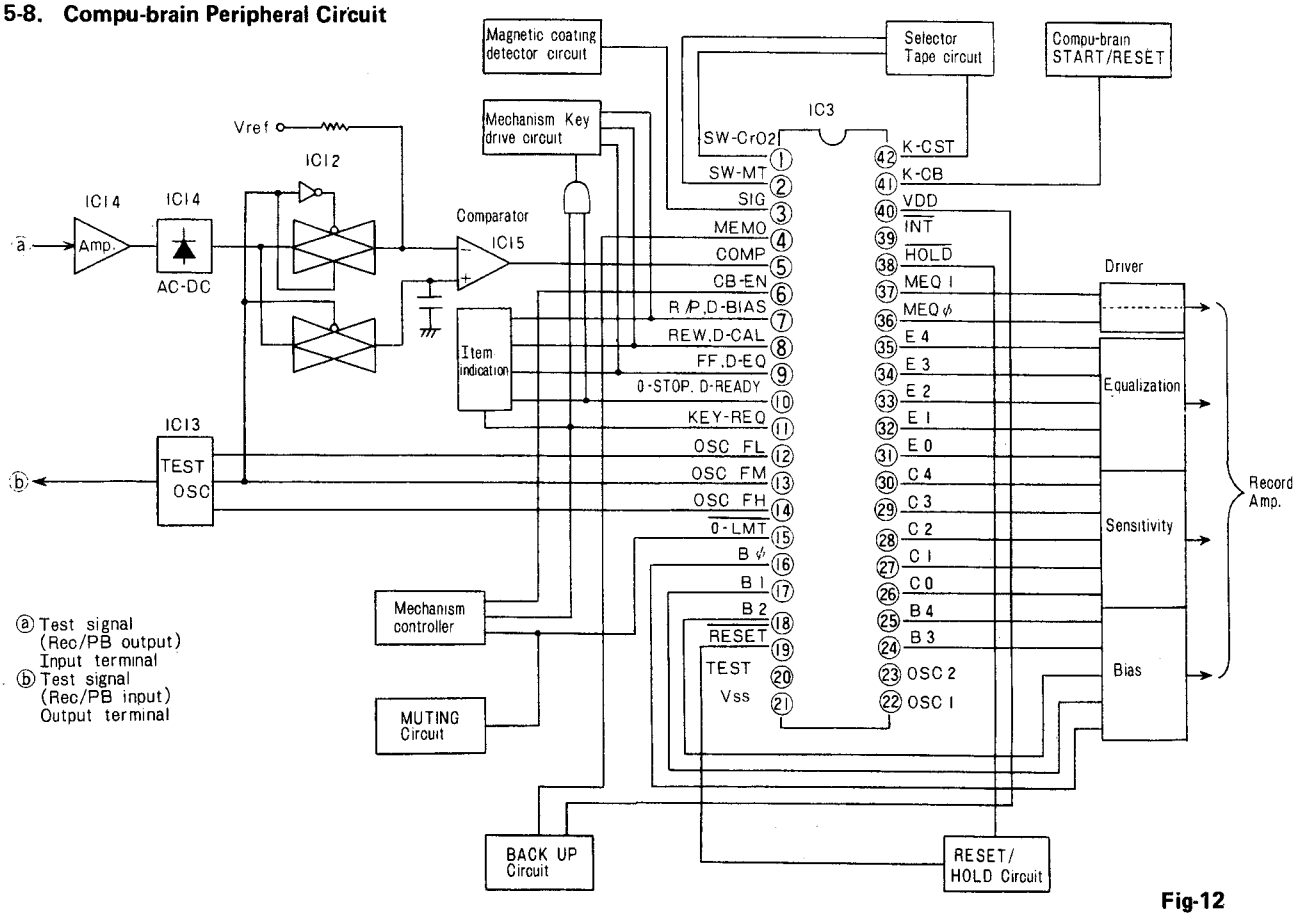



**Fig-12**

**5-8-1. Test oscillator:** This is the testing oscillator and sets the frequency via 3 outputs shown below.
$F_L$: Reference frequency (400 Hz ~ 1 kHz)
$F_M$: Bias adjustment frequency (5 k ~ 8 kHz)
$F_H$: Equalizer adjustment frequency (10 k ~ 18 kHz)
The $F_M$ output switches the comparator input for bias adjustment, and is used for the control line transferred to the microcomputer as the difference between $F_M$ (output voltage) and $F_L$ (output voltage).

**5-8-2. Amp, AC-DC:** This amplifies the output signal and makes it direct current during testing.
Vref: Reference voltage during sensitivity adjustment and equalizer adjustment.

**5-8-3. Analog memory:** Holds the $F_L$ output voltage during bias adjustment.

**5-8-4. Comparator:** Comparator of the sequence comparative feedback.

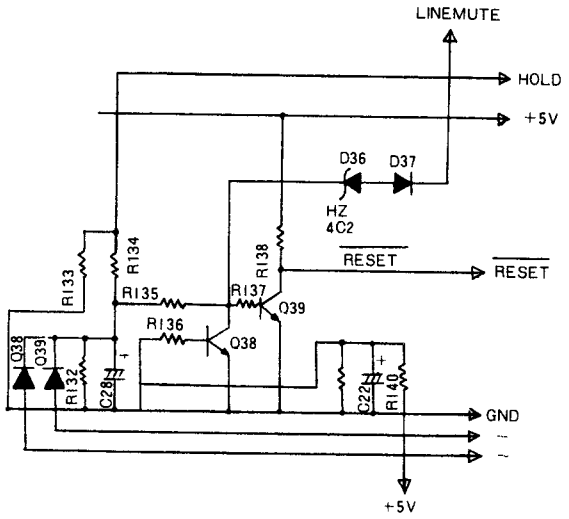
**5-8-5. Item indication:** Indicates items according to the adjustment procedure.

**5-8-6. Magnetic coating detector circuit:** Outputs Hi to the SIGNAL pin when the record/play output is present and outputs Lo when it is not present.

**5-8-7. Data driver:** Outputs the memory data inside the microcomputer to the recording circuit.

**5-8-8. RESET/HOLD circuit:** Produces the RESET/HOLD condition during power ON/OFF.

**5-8-9. Mechanism key drive circuit:** When a mechanism key is pressed during the compu-brian.




## 5-9. Detecting the Magnetic Coating

The magnetic coating of the tape is detected during compu-brain. Q37 is set to ON/OFF according to presence/absense of the record/play output; it is judged that the magnetic coating is present with the SIGNAL pin 3 set to Lo and it is not (leader tape, tape finish, etc.) with the SIGNAL pin 3 set to Hi. When it is judged that the magnetic coating is not present, the microcomputer outputs the standard data.

## 5-10. Operation after Power ON

1 When the power is set to ON, the voltage of the secondary winding of the transformer rises instantaneously, it is rectified via D38, D39, R132, C21 and the $\overline{\text{HOLD}}$ pin is set to Hi. Q39 is set to ON at this time, so the $\overline{\text{RESET}}$ pin is set to Lo. LINE MUTE during power ON is applied via D36, D37.

2 +5V rises and Q38 is set to ON with the time constant (approx. 20 msec) of R139, C22, so Q39 is set to OFF and the $\overline{\text{RESET}}$ pin is set to Hi via R138. (RESET completed)

3 When the $\overline{\text{RESET}}$ pin is set to Hi, the microcomputer starts operation and judges whether or not the MEMORY pin is set to Hi or Lo after 120 msec.

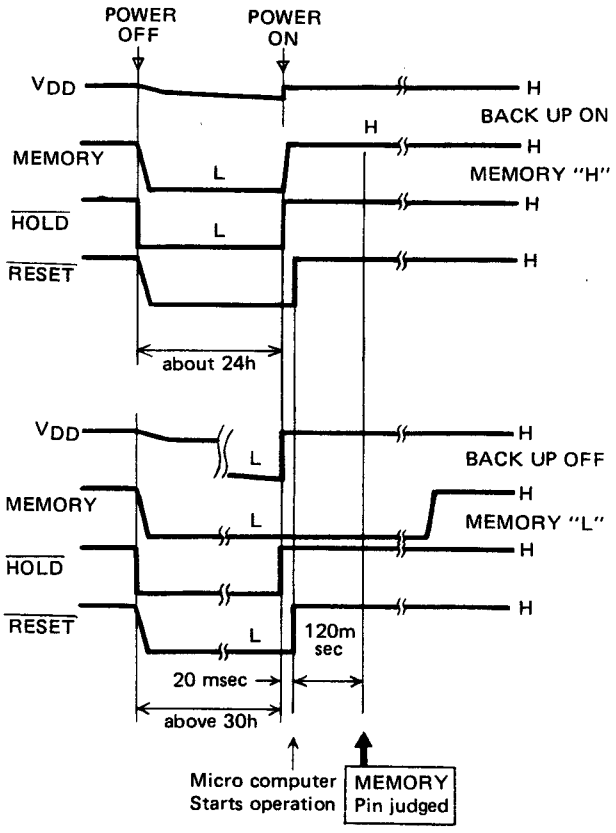



**Fig-13**

## 5-11. Operation after Power OFF

The $\overline{\text{HOLD}}$ pin is dropped to Lo instantaneously after power OFF and the reset pin to Lo.
Then, the microcomputer enters the $\overline{\text{HOLD}}$ mode.

**Operation of combination of $\overline{\text{HOLD}}$ and $\overline{\text{RESET}}$.**

| $\overline{\text{HOLD}}$ | $\overline{\text{RESET}}$ | OPERATION |
|---|---|---|
| H | H | Normal operation |
| L | H | HOLD |
| L | L | HOLD |
| H | L | RESET |

**Table 6**

## 5-12. HOLD Mode

With this microcomputer, the internal operation is stopped and power consumption is reduced by apply a Lo level to the $\overline{\text{HOLD}}$ pin. When the $\overline{\text{HOLD}}$ signal is applied, the unit enters the HOLD mode after the command being executed at present is completed. In the HOLD mode, the oscillation circuit is stopped, all the memories and registers, etc. except the interruption demand plug and timer keep the condition just before the HOLD mode.
The output port is set to high impedance, so the power voltage can be lowered to minimize power consumption in the HOLD mode.
The HOLD mode is released by returning the $\overline{\text{HOLD}}$ pin to Hi level while applying Lo level to the RESET pin to set the unit to the reset mode. When it is set to the timing shown in Fig. 13, the unit is set to the HOLD mode with power OFF and to the reset mode with power ON.

| | $V_{DD}$ |
|---|---|
| During normal operation | 4.5 ~ 5.5V |
| During HOLD mode | More than 1.8V |

**Table 7**

## 5-13. Compu-brain Flow Chart

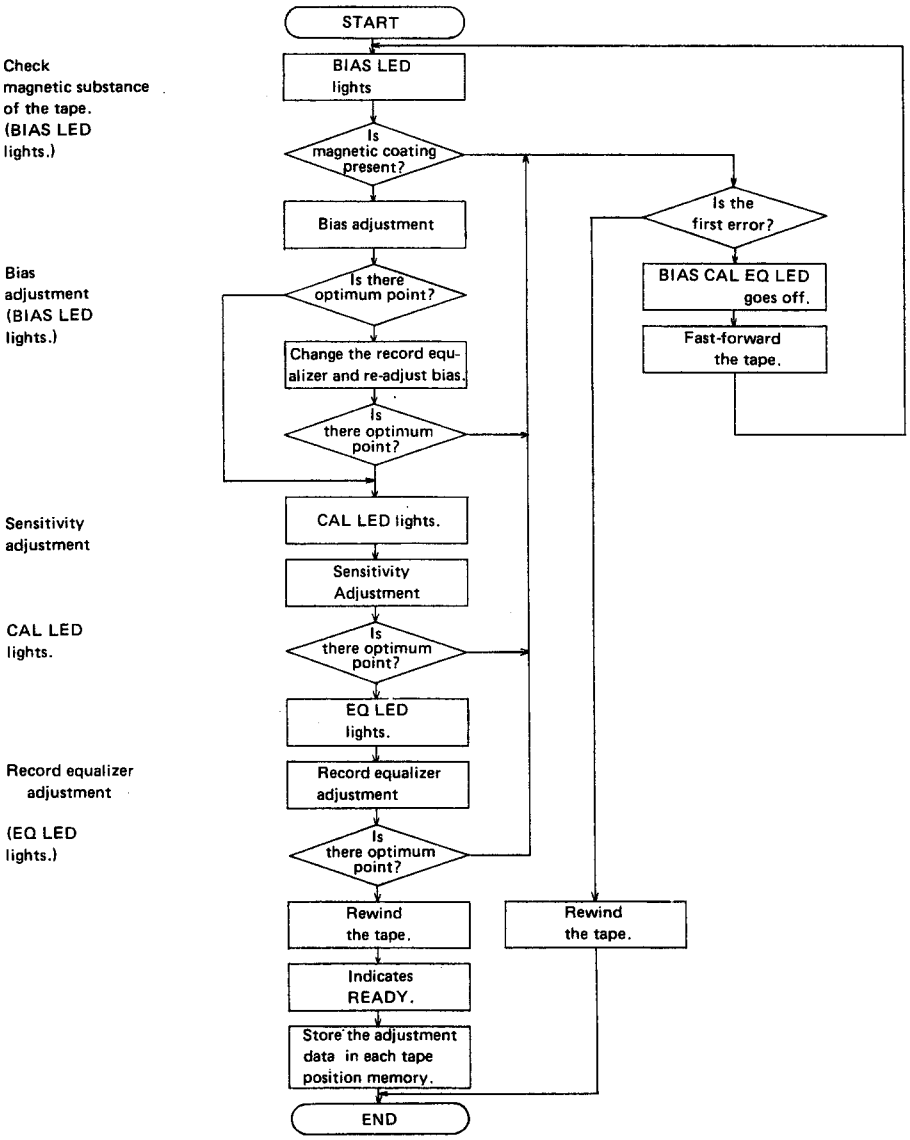



**Table 8**

# ELECTRICAL MAIN PARTS LIST

| Symbol No. | Part No. | Description |
|---|---|---|
| **≪MAIN CIRCUIT BOARD SECTION≫** | | |
| PCB-A | * | Main circuit board |
| ⏚IC1 | 82-191-645-01 | IC, μPD546C-357 |
| IC4, 202 | 87-027-538-01 | IC, μPD4069 |
| IC5 | 87-027-909-01 | IC, M54523P |
| IC6 | 87-027-840-01 | IC, M54519P |
| IC11 | 87-027-429-01 | IC, TC4016BP |
| ⏚IC12 | 87-027-800-01 | IC, HD14007UBP |
| IC13, 14, 15 | 87-027-235-01 | IC, NJM4558D |
| IC16 | 87-027-510-01 | IC, μPD4001 |
| IC201 | 87-027-949-01 | IC, NJM2043S-A |
| IC301, 401, 402, 501, 502, 503, 504 | 87-027-895-01 | IC, M5218L |
| IC601 | 87-027-739-01 | IC, NJM4556D |
| IC901 | 87-027-919-01 | IC, M5230L |
| Q3, 4, 5, 6, 18, 33, 34, 35, 36 | 89-107-335-61 | Transistor, 2SA733K (P) |
| Q7, 8 | 89-109-521-01 | Transistor, 2SA952 (K) |
| Q9 | 89-408-862-01 | Transistor, 2SD886Q |
| Q10, 11, 12, 13, 14, 15, 16, 17, 37, 201, 202, 203, 204, 301, 302, 413, 504, 505, 506, 507, 508, 809 | 89-309-455-61 | Transistor, 2SC945L (PQ) |
| Q40, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 802 | 89-318-155-01 | Transistor, 2SC1815 (GR) |
| Q41 | 89-110-155-01 | Transistor, 2SA1015 (GR) |
| Q42 | 87-027-245-01 | FET, 2SK68-AK |
| Q411, 412, 501, 502, 803, 804, 805, 806, 807, 808, | 89-320-011-01 | Transistor, 2SC2001K |
| Q904 | 89-108-854-01 | Transistor, 2SA885R |
| Q509, 510 | 89-321-204-01 | Transistor, 2SC2120Y |
| Q503, 901 | 89-210-154-51 | Transistor, 2SB1015Y (GR) |
| Q902 | 89-414-064-51 | Transistor, 2SD1406Y (GR) |
| Q903 | 89-408-804-51 | Transistor, 2SD880Y (GR) |
| Q905 | 89-408-804-51 | Transistor, 2SD880Y (GR) (Transistor, 2SD1406Y (GR) |
| Q906 | 89-105-054-01 | Transistor, 2SA505 (Y) |
| D1 ~ 19, 24, 25, 31, 32, 40, 41, 42, 46 ~ 49 201 ~ 204, 501, 502, 503, 507 ~ 510 804, 805 808, 809 | 87-027-219-01 | Diode, MA150 |
| D26, 27, 28, 29 | 88-052-188-11 | Diode, IS188FM |
| D30, 801 | 87-027-365-01 | Diode, S5277B |
| D33, 34, 35, 43, 44, 45 | 87-027-097-01 | Diode, IS1555 |
| D505 | 87-027-555-01 | Zener diode, HZ-5C2 |
| D803, 904 | 87-027-244-01 | Zener diode, 05Z-8.2U |
| D901 | 87-027-815-01 | Diode, 1B4B1 |
| D902, 903 | 87-027-475-01 | Zener diode, HZ-6B1 |
| D905 | 87-027-393-01 | Zener diode, HZ4C2 |
| D906 | 87-027-469-01 | Zener diode, HZ-16-2 |
| L1 | 82-191-656-01 | Coil, 400K 10EZ |
| L301, 302 | 82-190-629-01 | Filter LP, 85K-2 |
| L303, 304 | 87-030-061-01 | Filter LP, 85K |
| L501 | 82-190-660-01 | Coil, OSC EH |
| L502, 503 | 87-003-051-01 | Choke coil, 470μH |
| L505, 506 | 82-190-627-01 | Coil, F10 |
| L507, 508 | 82-371-622-01 | Coil, 23mH |
| RY301 | 87-031-751-01 | SW solenoid |
| J1, 2 | 82-191-648-01 | Jack, 6.3φ W/switch (MIC) |
| J3, 4, 5, 6 | 87-049-055-01 | Pin jack, 4P (LINE IN, LINE OUT) |
| J8 | 87-032-985-01 | DIN socket (REMOTE) |
| S2 | 82-191-655-01 | Push—switch (MONITOR) |
| S18 | 87-031-752-01 | Slide switch (MPX FILTER) |
| SFR1 | 87-021-570-01 | Semi-fixed resistor, 100kΩ-B |
| SFR201, 202 | 87-021-624-01 | Semi-fixed resistor, 50kΩ-B |
| SFR203, 204 | 87-021-687-01 | Semi-fixed resistor, 30kΩ-B |
| SFR403, 404 | 87-021-568-01 | Semi-fixed resistor, 20kΩ-B |
| SFR501, 502 | 87-021-622-01 | Semi-fixed resistor, 10kΩ-B |
| PIN1 | 87-049-279-01 | Pin, 9P |
| PIN2 | 87-049-276-01 | Pin 6P |
| PIN3 | 87-049-150-01 | Pin, 10P |
| PIN4 | 87-049-152-01 | Pin, 12P |
| PIN5, 6, 8 13 | 87-049-038-01 | Pin, 3P |
| PIN7 | 87-049-044-01 | Pin, 7P |
| PIN9 | 87-049-050-01 | Pin, 6P |
| PIN10 | 87-049-035-01 | Pin, 8P |
| PIN11, 16, 17 | 87-049-065-01 | Pin, 5P |
| PIN15 | 87-049-034-01 | Pin, 4P |
| PIN18 | 87-049-143-01 | Pin, 3P |
| CON19 | 82-191-687-01 | Connector, 3P-B |
| CON20 | 82-191-689-01 | Connector ass'y, 3P-A |
| CON 21 | 82-191-688-01 | Connector, 4P |
| | | **<Resistors>** |
| ⚠R505 | 87-029-089-01 | 4.7Ω ¼W Fuse resistor |
| ⚠R541, 542, 901, 902 | 87-029-023-01 | 47Ω ¼W Fuse resistor |
| ⚠R903, 904 | 87-029-007-01 | 22Ω ¼W Fuse resistor |
| ⚠R912, 913 | 87-029-017-01 | 10Ω ¼W Fuse resistor |
| ⚠R915 | 87-029-108-01 | 1Ω ½W Fuse resistor |
| ⚠R918, 919 | 87-029-019-01 | 2.2Ω ½W Fuse resistor |
| | | **<Capacitors>** |
| C28 | 82-191-665-01 | 0.022F 5V Super capacitor |
| C205, 206 | 87-014-119-01 | 0.027μF PP |
| C209, 210, 309, 310 | 87-015-425-01 | 0.1μF Aluminum solid |
| C401, 402 | 87-014-049-01 | 470pF PP |
| C411, 412 | 87-014-051-01 | 560pF PP |
| C501 | 87-014-118-01 | 0.015μF PP |
| C507 | 87-015-379-01 | 1μF 50V Electrolytic BP |
| C403, 404, 515, 516 | 88-707-789-81 | 0.33μF 100V TF |
| C523, 524 | 87-014-061-01 | 1500pF PP |
| C525, 526 | 87-004-055-01 | 820pF PP |
| C531, 532 | 87-014-037-01 | 150pF PP |

| Symbol No. | Part No. | Description |
|---|---|---|
| **≪DOLBY-NR1, 2 CIRCUIT BOARD SECTION≫** | | |
| IC1, 2 | 87-027-918-01 | IC HA12038-01 |
| L1, 2 | 87-005-155-01 | Coil, 36mH |
| PIN | 87-049-117-01 | Pin, 7P |
| PIN | 87-049-119-01 | Pin, 9P |
| | | **<Resistors>** |
| R9, 10 | 87-025-271-01 | 5.1kΩ ¼W Metal film resistor |
| R11, 12 | 87-025-295-01 | 15kΩ ¼W Metal film resistor |
| R35, 36 | 87-025-296-01 | 56kΩ ¼W Metal film resistor |
| | | **<Capacitors>** |
| C15, 16 | 87-015-617-01 | 10μF 16V Electrolytic LL |
| C21, 22, 23, 24, 45, 46 | 87-015-366-01 | 0.15μF 10V Aluminum solid |
| **≪FL CIRCUIT BOARD SECTION≫** | | |
| PCB-D | * | FL circuit board |
| ⏚IC2 | 82-191-644-01 | IC, HD 38755A62 |
| IC17 | 87-027-920-01 | IC, AN6870N |
| IC18 | 87-027-564-01 | IC, TC4011BP |
| ⏚IC19, 20, 21, 22 | 87-027-565-01 | IC, TC4081BP |
| IC701 | 87-027-895-01 | IC, M5218L |
| Q19 ~ 21, 701, 702 | 89-309-455-61 | Transistor, 2SC945L (PQ) |
| Q22 | 89-318-156-01 | Transistor, 2SC1815 (BL) |
| Q907, 908 | 89-313-846-01 | Transistor, 2SC1384 (R) |
| D20, 21, 22, 23, 63, 64, 65, 66, 67, 68, 70, 703, 704, 705 | | |
| D69 | 87-027-475-01 | Zener diode, HZ-6B1 |
| D705 | 87-027-469-01 | Zener diode, HZ-16-2 |
| L901 | 82-401-661-01 | Choke coil, 600μH |
| L902 | 82-191-658-01 | Coil, OSC FL |
| X1 | 87-008-236-01 | Ceramic resonator CSB400P |
| FL1 | 82-191-650-01 | FIP 76AW18Y |
| SFR701, 702 | 87-021-564-01 | Semi-fixed resistor, 1kΩ-B |
| SFR703 | 87-021-622-01 | Semi-fixed resistor, 10kΩ-B |
| PIN12 | 87-049-050-01 | Pin, 6P |
| PIN14 | 87-049-034-01 | Pin, 4P |
| PIN19, 20 | 87-049-038-01 | Pin, 3P |
| CON6 | 82-191-690-01 | Connector ass'y, 3P-B |
| CON7 | 82-191-696-01 | Connector ass'y, 7P |
| CON8 | 82-191-698-01 | Connector ass'y, 3P-C |
| | | **<Resistor>** |
| ⚠R924 | 87-029-017-01 | 10Ω ¼W Fuse resistor |
| | | **<Capacitors>** |
| C40 | 87-014-118-01 | 0.015μF PP |
| C45 | 87-015-141-01 | 10μF 16V Electrolytic BP |
| **≪FRTS CIRCUIT BOARD SECTION≫** | | |
| PCB-E | * | FRTS circuit |
| ⏚IC3 | 82-191-643-01 | IC, LA6505C-609 |
| IC8, 9, 10 | 87-027-948-01 | IC, M54514AP |
| Q23 ~ 32 | 89-320-011-01 | Transistor, 2SC2001K |
| Q38, 39 | 89-309-455-61 | Transistor, 2SC945L (PQ) |
| D36 | 87-027-393-01 | Zener diode, HZ4C2 |
| D37, 38, 39 | 87-027-219-01 | Diode, MA150 |
| | 87-049-114-01 | Pin, 4P |
| | 87-049-115-01 | Pin, 5P |
| | 87-049-117-01 | Pin, 7P |
| | 87-049-119-01 | Pin, 9P |

| .Symbol No. | Part No. | Description |
|---|---|---|
| **≪AUTO STOP CIRCUIT BOARD SECTION≫** | | |
| PCB-F | 81-505-605-01 | Auto stop circuit board |
| CP501, 502 | 87-027-644-01 | Photo sensor, NJL-5141EA |
| **≪SWITCH-1 CIRCUIT BOARD SECTION≫** | | |
| PCB-G | * | Switch-1 circuit board |
| S3, 4 | 87-031-692-01 | Push-switch (DOLBY ON/OFF, DOLBY B/C) |
| VR1 | 82-191-646-01 | Volume, 10kΩ-A (OUTPUT LEVEL) |
| VR3 | 82-191-647-01 | Volume 250kΩ-W |
| **≪SWITCH-2 CIRCUIT BOARD SECTION≫** | | |
| PCB-H | * | Switch-2 circuit board |
| S1 | 82-191-657-01 | Slide switch (TIMER) |
| **≪SWITCH-3 CIRCUIT BOARD SECTION≫** | | |
| PCB-I | * | Switch-3 circuit board |
| ⚠S26 | 87-031-753-01 | Push-switch (POWER) |
| ⚠F1 | 87-035-216-01 | Fuse, "T" 200mA (E, K, G model only) |
| | 87-033-147-01 | Fuse clamp |
| | | **<Capacitor>** |
| ⚠C918 | 87-019-112-01 | 0.01μF Spark killer |
| **≪JACK CIRCUIT BOARD SECTION≫** | | |
| PCB-J | * | Jack circuit board |
| J7 | 82-191-649-01 | Jack (HEADPHONES) |
| **≪VOLUME CIRCUIT BOARD SECTION≫** | | |
| PCB-K | 82-190-642-01 | Volume circuit board |
| VR3 | 82-191-641-01 | Slide volume, 100kΩ-A (REC LEVEL) |
| CON9 | 82-191-697-01 | Connector, 6P |
| **≪KEY BOARD CIRCUIT BOARD SECTION≫** | | |
| PCB-L | 82-190-641-01 | Key board circuit board |
| D52 | 87-027-922-01 | LED, SR206D (PAUSE) |
| D53 | 87-027-923-01 | LED, SY406D (PLAY) |
| D54, 55 | 87-027-921-01 | LED, SR506D (REC, REC MUTE) |
| S5, 6, 7, 11, 12, 13, 14, 15, 19 | 87-031-498-01 | Push-switch (STOP, PAUSE, REC MUTE, REW, PLAY FF, REC, MS COMPU BRAIN) |
| S8, 9, 10, 16, 17 | 87-031-642-01 | Tact switch (RESET MEMO REWIND, REPLAY/STOP, TAPE TIME) |
| CON10 | 82-191-654-01 | Connector ass'y, 8P |
| CON11 | 82-191-653-01 | Connector ass'y, 5P |
| CON12 | 82-191-652-01 | Connector ass'y, 6P |
| **≪LED CIRCUIT BOARD SECTION≫** | | |
| PCB-M | * | LED circuit board |
| D51, 60, 808 | 87-027-542-01 | LED, LN217RP (METAL, C, INTRO) |
| D50, 56, 57, 58, 62, 807, 809 | 87-027-543-01 | LED, LN317GP (MS, BIAS, CAL, EQ, NORMAL, TAPE, B,) |
| D59 | 87-027-819-01 | LED, LT-9030N, G3-8 (READY) |
| D60, 504, 806 | 87-027-671-01 | LED, LN417YP ($CrO_2$, ADMS, SOURCE) |
| CON13 | 82-191-651-01 | Connector ass'y, 3P |
| CON14 | 82-191-692-01 | Connector ass'y, 4P-B |
| CON15 | 82-191-691-01 | Connector ass'y, 4P-A |
| CON16 | 82-191-695-01 | Connector ass'y, 5P-B |
| CON17 | 82-191-694-01 | Connector ass'y, 5P-A |

| | Description |
|---|---|
| **T BOARD SECTION ≫** | |
| 5-01 | Auto stop circuit board |
| 1-01 | Photo sensor, NJL-5141EA |
| **BOARD SECTION ≫** | |
| | Switch-1 circuit board |
| 2-01 | Push-switch (DOLBY ON/OFF, DOLBY B/C) |
| 3-01 | Volume, 10kΩ-A (OUTPUT LEVEL) |
| 7-01 | Volume 250kΩ-W |
| **BOARD SECTION ≫** | |
| | Switch-2 circuit board |
| 1-01 | Slide switch (TIMER) |
| **BOARD SECTION ≫** | |
| | Switch-3 circuit board |
| -01 | Push-switch (POWER) |
| -01 | Fuse, "T" 200mA (E, K, G model only) |
| -01 | Fuse clamp |
| | < Capacitor > |
| -01 | 0.01μF Spark killer |
| **RD SECTION ≫** | |
| | Jack circuit board |
| -01 | Jack (HEADPHONES) |
| **OARD SECTION ≫** | |
| -01 | Volume circuit board |
| -01 | Slide volume, 100kΩ-A (REC LEVEL) |
| -01 | Connector, 6P |
| **T BOARD SECTION ≫** | |
| -01 | Key board circuit board |
| -01 | LED, SR206D (PAUSE) |
| -01 | LED, SY406D (PLAY) |
| -01 | LED, SR506D (REC, REC MUTE) |
| -01 | Push-switch (STOP, PAUSE, REC MUTE, REW, PLAY FF, REC, MS COMPU BRAIN) |
| -01 | Tact switch (RESET MEMO REWIND, REPLAY/STOP, TAPE TIME) |
| 01 | Connector ass'y, 8P |
| 01 | Connector ass'y, 5P |
| 01 | Connector ass'y, 6P |
| **) SECTION ≫** | |
| | LED circuit board |
| 01 | LED, LN217RP (METAL, C, INTRO) |
| 01 | LED, LN317GP (MS, BIAS, CAL, EQ, NORMAL, TAPE, B,) |
| 01 | LED, LT-9030N, G3-8 (READY) |
| 01 | LED, LN417YP ($CrO_2$, ADMS, SOURCE) |
| 01 | Connector ass'y, 3P |
| 01 | Connector ass'y, 4P-B |
| 01 | Connector ass'y, 4P-A |
| 01 | Connector ass'y, 5P-B |
| 01 | Connector ass'y, 5P-A |

| Symbol No. | Part No. | Description |
|---|---|---|
| **≪MISCELLANEOUS≫** | | |
| ⚠T1 | 82-191-632-01 | Power transformer (H, HU models only) |
| ⚠T1 | 82-191-633-01 | Power transformer (U model only) |
| ⚠T1 | 82-191-634-01 | Power transformer (E model only) |
| ⚠T1 | 82-191-635-01 | Power transformer (K, G models only) |
| RPH | 87-046-194-11 | REC/PB head |
| EH | 87-046-192-01 | Erase head |
| M501 | 87-045-175-01 | DC servo motor system |
| M502 | 09-011-038-01 | Reel motor ass'y |
| D907 | 87-027-944-01 | LED, SLF 301C |
| ⚠ | 87-034-958-01 | AC power cord (H, HU models only) |
| ⚠ | 87-034-951-01 | AC power cord (U model only) |
| ⚠ | 87-034-877-01 | AC power cord (E model only) |
| ⚠ | 87-034-975-01 | AC power cord (K model only) |
| ⚠ | 87-034-892-01 | AC power cord (G model only) |
| ⚠ | 87-085-184-01 | AC power cord bushing D (H, HU, U models only) |
| ⚠ | 82-085-184-01 | AC power cord bushing (E, K, G models only) |
| S20, 21, 22, 23 | 81-505-607-01 | Leaf switch (REC, $CrO_2$, METAL, CASSETTE) |
| S24, 25 | 81-505-601-01 | Leaf switch (PLAY, PAUSE) |
| S27 | 87-031-586-01 | Rotary switch (VOLTAGE SELECTOR) (H, HU models only) |
| CON1 | 81-505-631-11 | Connector ass'y, 9P |
| CON2 | 81-507-602-01 | Connector ass'y, 6P |
| CON3 | 81-505-632-01 | Connector ass'y, 10P |
| CON4 | 81-507-601-01 | Connector ass'y, 12P |
| CON5 | 81-051-003-01 | Connector ass'y, 3P |

⚠ Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

**C-MOS IC handling precaution**
The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.
1. Need to be put on conductive sheet, to be put in a metallic box and to be wrapped by aluminium foil for transportation and deposit.
2. To use solder iron less than 40W (less than 260°C) of power consumption for soldering. But do not overheat more than 10 second.
3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark ( ⚡ ).

**Note; Combination Circuit Board**
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

**Combination circuit board A 82-191-601-11**

| | |
|---|---|
| **PCB-A** | **82-191-602-11** |
| **PCB-G** | **82-191-603-11** |
| **PCB-J** | **82-191-604-11** |
| **PCB-H** | **82-191-605-11** |
| **PCB-M** | **82-191-606-11** |

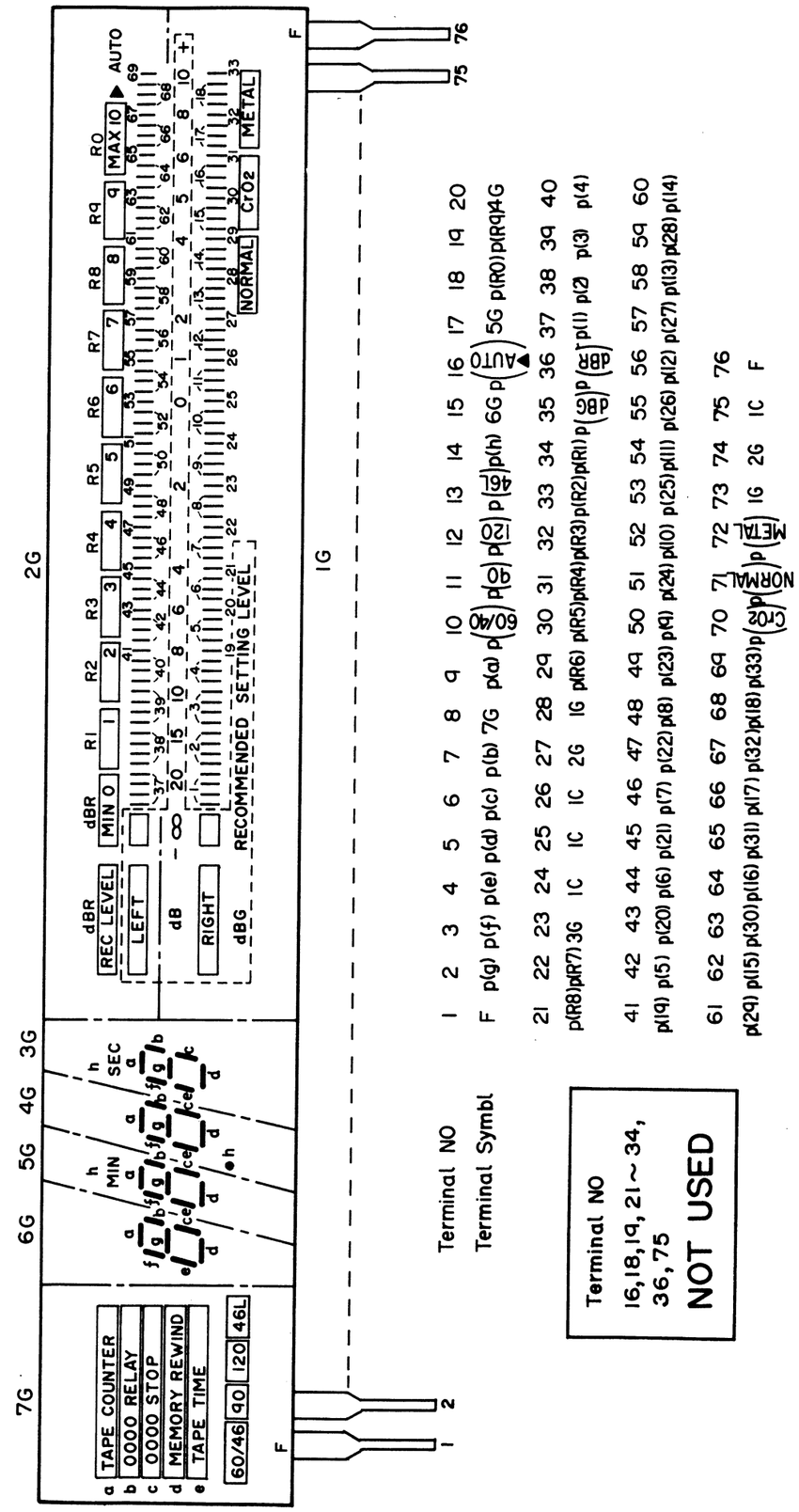
**Combination circuit board B 82-191-611-21**

| | |
|---|---|
| **PCB-D** | **82-191-612-21** |
| **PCB-E** | **82-191-614-21** |

■ Ceramic capacitor

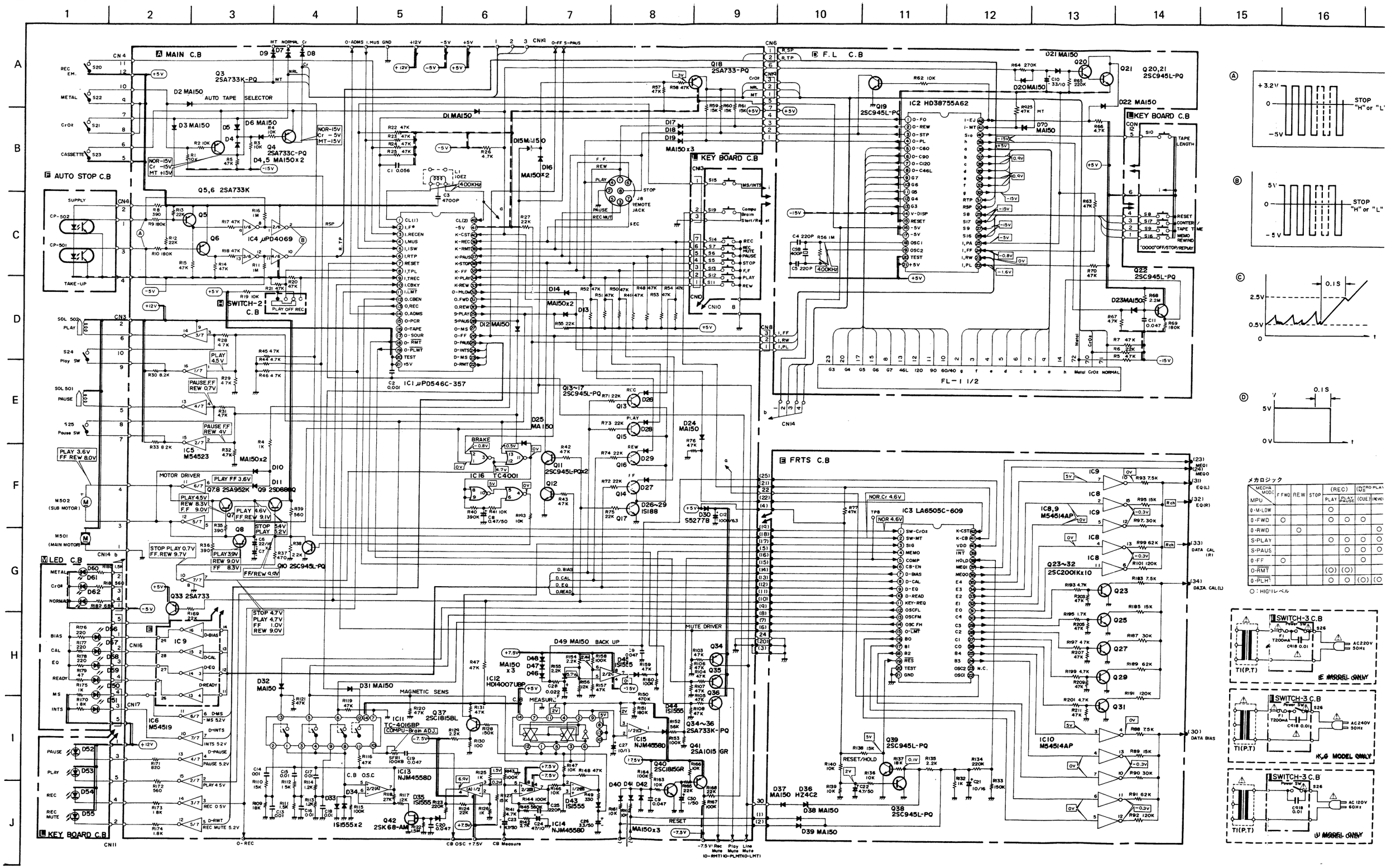
87−018−□□□−01

| Capacitor | Parts code |
|---|---|
| 100P | 032 |
| 150P | 034 |
| 180P | 035 |
| 220P | 036 |
| 470P | 040 |
| 1000P | 044 |
| 0.01 | 047 |



# SCHEMATIC DIAGRAM –1

NOTES:
1) ■ B (+) power supply ▮▮▮▮ B (–) power supply
2) ➡ Signal path
   ⇨ Rec path




Ⓐ



Ⓑ



Ⓒ



Ⓓ



メカロジック

| MECHA MODE / MPU | F.FWD | REW | STOP | (REC) PLAY | (REC) PLAY PAUSE | INTRO PLAY (CUE) | INTRO PLAY (REVIEW) |
|---|---|---|---|---|---|---|---|
| 0-M-LOW | | | | ○ | | | |
| 0-FWD | ○ | | | ○ | ○ | ○ | |
| 0-RWD | | ○ | | | | | ○ |
| S-PLAY | | | | ○ | ○ | ○ | ○ |
| S-PAUS | | | | | ○ | ○ | ○ |
| 0-FF | ○ | | | | | ○ | |
| 0-RMT | | | | (○) | (○) | | |
| 0-PLMT | | | | ○ | ○ | (○) | (○) |

○ : HIGHレベル

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Ⓐ +3.2V 0 −5V STOP "H" or "L"

Ⓑ 5V 0 −5V STOP "H" or "L"

Ⓒ 2.5V 0.5V 0 0.1S t

Ⓓ 5V 0V 0.1S t

メカロジック

| MECHA MODE / MPU | F FWD | REW | STOP | (REC) PLAY | (REC) PLAY PAUSE | (REC) (CUE) | (INTRO PLAY) (REVIEW) |
|---|---|---|---|---|---|---|---|
| 0-M-LOW | | | | ○ | | | |
| 0-FWD | ○ | | | ○ | ○ | ○ | |
| 0-RWD | | ○ | | | | | ○ |
| S-PLAY | | | | ○ | ○ | ○ | ○ |
| S-PAUS | | | | | ○ | ○ | ○ |
| 0-FF | ○ | | | | | ○ | |
| 0-RMT | | | | (○) | (○) | | |
| 0-PLH | | | | ○ | ○ | (○) | (○) |

○ : HIGHレベル

A MAIN C.B

IC202 μPD4069

IC201 NJM2043SA

IC301 M5218L

IC501 M5218L

IC502 M5218L

IC503 M5218L

IC504 1/2(D)

REC BUFFER Q301 2SC945L-PQ

DOLBY-NR CIRCUIT

PLAYBACK FREQUENCY CHARACTERISTICS ADJ.

PLAYBACK SENSITIVITY ADJ.

CUE / REV MUTE

PLAY MUTE

LINE MUTE

H.P AMP

IC601 NJM4556D

REC AMP IC401 M5218L

REC MUTE

LH REC/PB SENSITIVITY ADJ.

METAL MEDIUM EQ ADJ.

BIAS TRAP ADJUSTMENT

BIAS OSC OUTPUT ADJ.

LH REC/PB FREQUENCY CHARACTERISTICS ADJ.

MIC AMP

MPX FILTER

B SWITCH-1 C.B

C SWITCH-2 C.B

A MLED C.B

B FL C.B

J JACK C.B

METER AMP

IC701 M5218L

IC18 TC-40118P PEAK HOLD TIMER

METER MUTE

IC17 AN6870

IC19~22 TC4066 X4

FL-1 2/2

SWITCH-3 C.B

T1 (P.T)

E MODEL ONLY

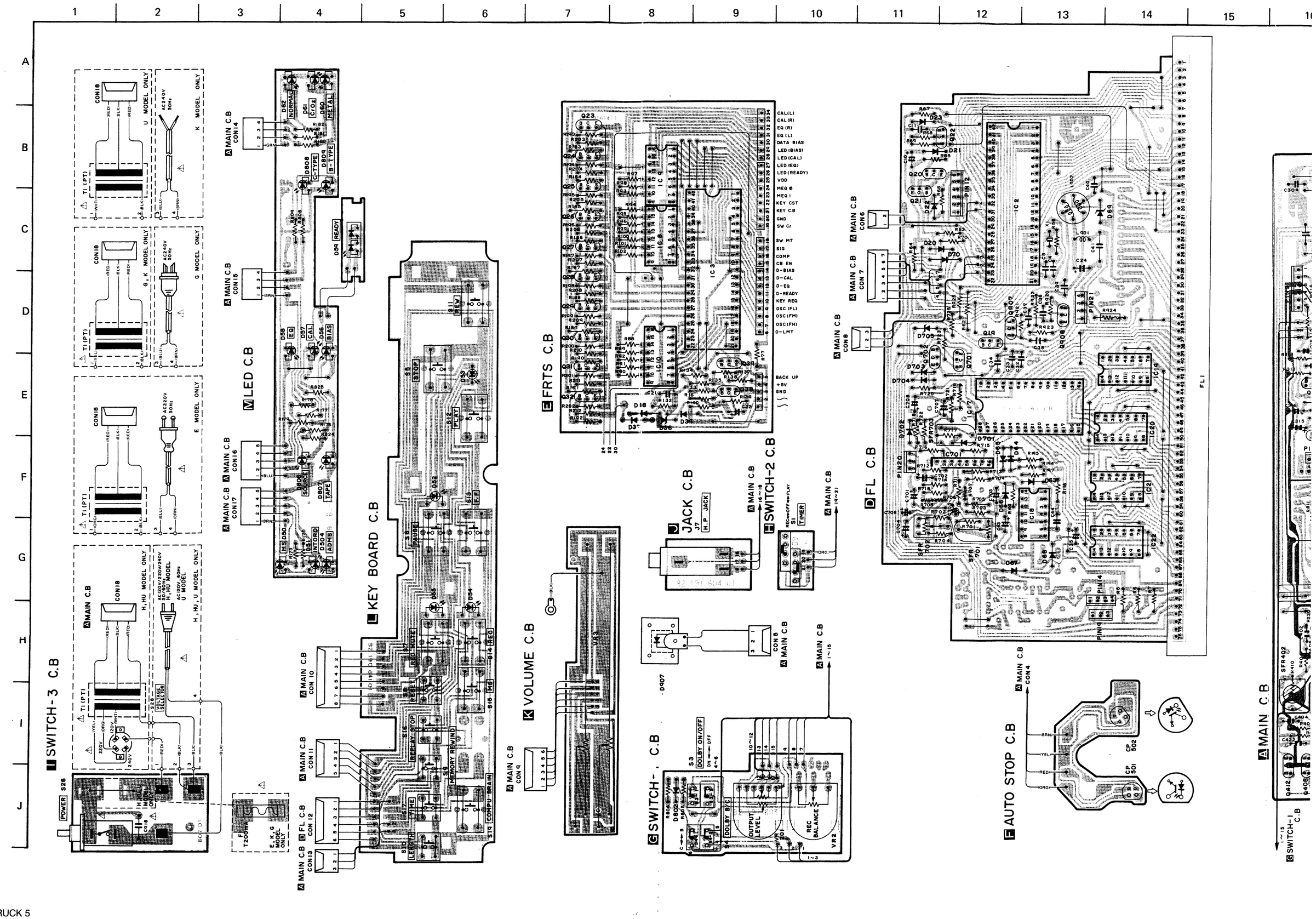
K,G MODEL ONLY

U MODEL ONLY

H,HU MODEL ONLY

NOTES (1) ■ B(+) Pattern ▒ Others pattern
(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.

## WIRING



13. Erase Head Adjustment
Settings:
- Tape selector: METAL
- Test tape: TTA-119MX
- Input signals: 12kHz, indicator +10dB
- Adjustment location: Erase head adjustment screw

Method:
Record a signal and rewind the tape.
Erase the signal with no input signal and adjust so that the erase ratio is 60dB or more for both L and R channels.
Check no over-erasing of the opposite tracks occurs.

2. Azimuth adjustment
Settings:
- Test tape: TTA-117E
- Adjustment location: Azimuth adjustment screw.

CON 1 CON 2

R.P.H E.H

B,C DOLBY-NR C.B

A MAIN C.B

1. Tape Speed Adjustment
Setting:
- Adjustment location: SFR of motor

CON 3 CON 4

F AUTO STOP C.B

CASSETTE S23 METAL S22 CrO2 S21 REC S20

S24 PLAY S25 PAUSE M501 M502 SOL501 SOL502

E FRTS C.B

H SWITCH-2 C.B 14~21

REMOTE J8

S2 MONITER J1,2 MIC J3,4 LINE IN J5,6 LINE OUT S18 MPX FILTER J6~18 JACK C.B

FL C.B CON21

A MAIN C.B

G SWITCH-1 C.B 1~15

FRTS C.B 24

FL C.B CON20

FL C.B CON19

SCHEMATIC
1

**12. Compu-Brain Adjustment**
**Settings:**
- Test point: TP8
- Adjustment locations: SFR1

**Method:**
Replace the wire from the Ⓐ to the Ⓑ and connect the resistors on the pins 12, 13 and 14 of IC11.
Adjust so that the waveform at the test point is square wave.
After adjustment, replace the wire as it was and disconnect the resistors.

**6. Bias OSC Frequency Adjustment**
**Settings:**
- Test point: TP3
- Adjustment iocation: L501

**Method:**
Adjust so that the frequency at test point becomes 85kHz ±1kHz.

**7. Bias OSC Output Adjustment**
**Settings:**
- Test tape: TTA-119G
- Test points: TP5 (Lch)
  TP4 (Rch)
- Adjustment locations: L505 (Lch)
  L506 (Rch)

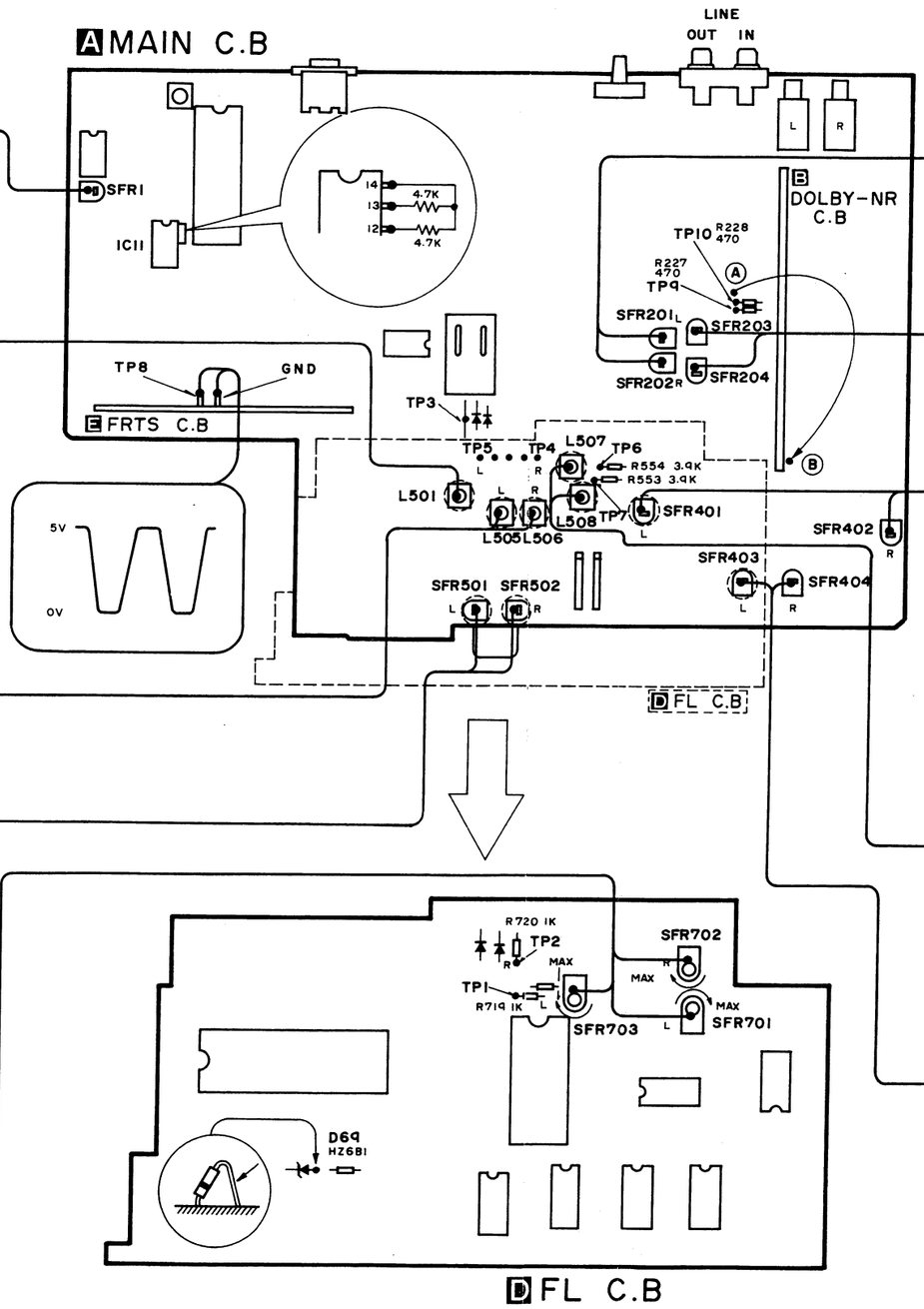
**Method:**
Record the test tape in $CrO_2$ position and adjust so that the output at the test point is minimum (−3.8 ~ −4V).

**9. LH REC/PB Frequency Characteristics Adjustment**
**Settings:**
- Test tape: TTA-119J
- Input signals: LINE IN 1kH/10kHz (1V)
- Test point: LINE OUT
- Adjustment locations: SFR501 (Lch)
  SFR502 (Rch)

**Method:**
Supply a 1kHz signal in SOURCE position and adjust the recording level so that the LINE output is 38mV.
Then, change in TAPE position, recording and playback the 1kHz and 10kHz signals and adjust so that the output of 10kHz is +0.5dB to 1dB based on the 1kHz output.

**5. Meter Adjustment**
**Settings:**
- Test point: TP1 (Lch)
  TP2 (Rch)
- Adjustment locations: SFR701 (Lch)
  SFR702 (Rch)
  SFR703 (L, Rch)
  Before adjustment turn the SFR701, SFR702 and SFR703 fully clockwise.

**Method:**
Connect a DC voltmeter ( ⊖ pin is a Zener diode as shown in the diagram) to the TP in the SOURCE mode.
Gradually lower the SFR from its max. to adjust so that it is +1.7V. Adjust both R and L channels.
Next, input the 1kHz signal to LINE IN and adjust REC VR so that LINE OUT is 380mV.
Gradually lower the SFR in this condition to adjust so that the +1dB of the FL meter goes out and the 0dB is lit.
Then vary the input level of LINE IN to check that the meter lights and goes off depending on each input (+1, +2, +3dB, +10dB, −10dB).




**3. Playback Frequency Characteristics Adjustment**
**Settings:**
- Test tape: TTA-117E
- DOLBY-NR: OFF
- Test points: LINE OUT
- Adjustment locations: SFR201 (Lch)
  SFR202 (Rch)

**Method:**
Playback the test tape and adjust so that the output of 10kHz is 0.5dB to 1.0dB based on the 1kHz output.

**4. Playback Sensitivity Adjustement**
**Settings:**
- Test tape: TTA-161
- DOLBY-NR: OFF
- Test point: LINE OUT
- Adjustment locations: SFR203 (Lch)
  SFR204 (Rch)

**Method:**
Playback the test tape and adjust so that the output of TP9 and TP10 is set to 580mV.

**10. LH REC/PB Sensitivity Adjustment**
**Settings:**
- Test tape: TTA-119J
- DOLBY-NR: OFF
- Input signal: 1kHz (1V)
- Adjustment locations: SFR401 (Lch)
  SFR402 (Rch)

**Method:**
Supply a 1kHz signal in SOURCE position and adjust the recording level so that the LINE output is 38mV.
Recording and playback and adjust so that the tape output is 38mV.

**8. Bias Trap Adjustment**
**Settings:**
- Test tape: TTA-119MX
- Test points: TP7 (Lch)
  TP6 (Rch)
- Adjustment locations: L507 (Lch)
  L508 (Rch)

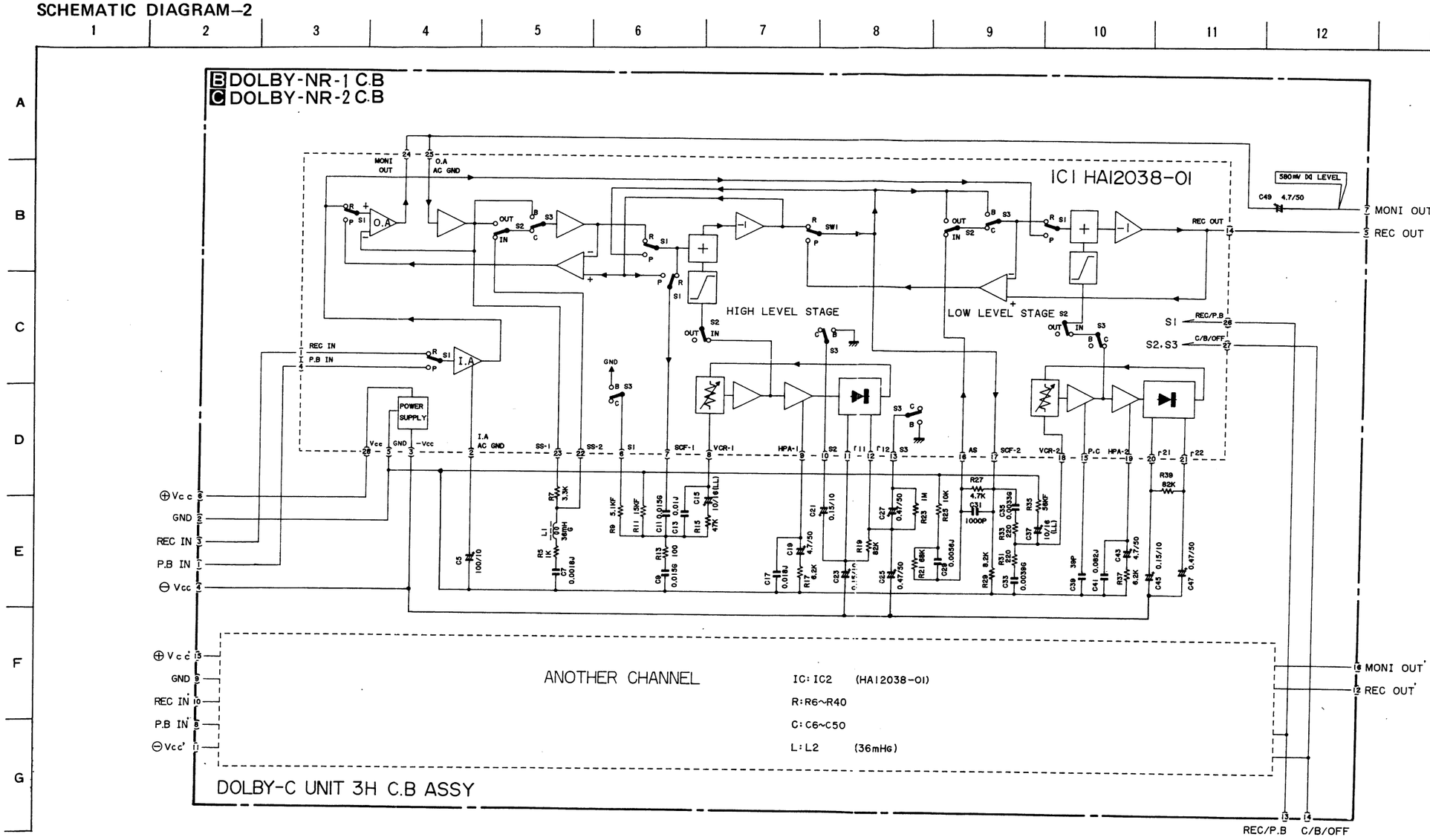
**Method:**
Record the test tape in METAL position and adjust so that the output at the test point is minimum.

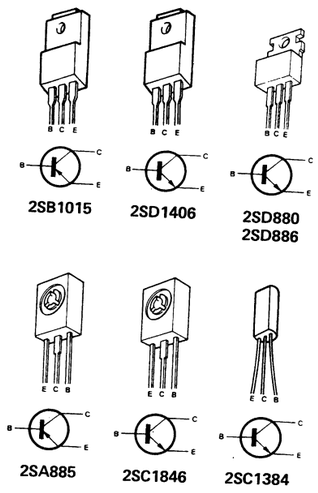
**11. METAL Medium EQ Adjustment**
**Settings:**
- Test tape: TTA-119MX
- DOLBY-NR: OFF
- Input signals: 1kHz, 10kHz
- Adjustment locations: SFR403 (Lch)
  SFR404 (Rch)

**Method:**
Supply a 1kHz signal in SOURCE position and adjust the recording level so that the LINE output is 38mV.
Then, change in TAPE position, recording and playback the 1kHz signals and adjust so that the output of 10kHz is 0dB to 0.5dB based on the 1kHz output.

**NOTES:**
1) ■ B (+) powe
2) ➡ Signal path
   ⇨ Rec path
3) The voltage is
   tester (20 k-ohn
   But ( ˙ ) is wi
   An asterisk (*)
   with a vacuum-t
4) Resistors with
   1/4W and a tole
5) Capacitors with
   strneght of less t
6) The only capac
   and ±10% (K).
7) Ceramic capacit
   ⊣⊢ For temper
   ⊣⊢ High dielec
   ⊣⊢ High dielec
   ⊣⊢ Semicondu
   ⊣⊢ For temper

## SCHEMATIC DIAGRAM–2




**NOTES:**

1) ■ B (+) power supply ▮▮▮ B (–) power supply
2) ➡ Signal path
   ⇨ Rec path
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals. But ( ' ) is with recording.
   An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectirc strneght of less than 50WV.
6) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
7) Ceramic capacitor symbols:
   For temperature compensation (SL)
   High dielectric constant system (YY)
   High dielectric constant system (YW, YP, YZ)
   Semiconductor ceramic
   For temperature compensation (SH)
8) Explanation of symbols
   (M) Mylar capacitor
   (A) Aluminum solid capacitor
   (PP) Polypropylene film capacitor
   (BP) Bi-polarized capacitor
   (LL) Low-leakage capacitor
   (T) Tantalum capacitor
   Fuse resistor
   Nonflammable resistor

   ⚠ Safety component symbol
   This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.
- This schematic diagram is subject to change without notice in the interests of improved performance.

# ACCESSORIES/PACKAGE LIST

| Ref. No. | Part No. | Part No. Changed to | Description | Common Model | Q'ty | |
|---|---|---|---|---|---|---|
| 1 | 82-191-852-01 | | Printed indiv., Packing | * | 1 | |
| 2 | 82-188-852-01 | | Cushion L, Printed indiv. | | 1 | |
| 3 | 82-188-853-01 | | Cushion R, Printed indiv. | | 1 | |
| 4 | 82-191-853-01 | | Outer carton(H,HU,E,K,G models only) | * | 1/3 | |
| 5 | 82-191-854-01 | | Outer carton (U model only) | * | 1/3 | |
| 6 | 87-051-131-11 | | Poly-vinyl sack (H, HU, U models only) | | 1 | |
| 7 | 87-051-135-11 | | Poly-vinyl sack (E, K, G models only) | | 1 | |
| 8 | 87-056-627-01 | | Poly-vinyl sack | | 1 | |
| 9 | 82-191-904-01 | | Instructions booklet | * | 1 | |
| 10 | 87-051-171-11 | | Poly-vinyl sack | | 1 | |
| 11 | 87-056-008-11 | | Label, AC power cord (K model only) | | 1 | |
| 12 | 87-056-009-51 | | Distributors list (H, E, K, G models only) | | 1 | |
| 13 | 87-056-045-01 | | Guarantee card (HU, U models only) | | 1 | |
| 14 | 87-056-057-01 | | Service station list (HU, U models only) | | 1 | |
| 15 | 87-056-059-01 | | Guarantee card (G model only) | | 1 | |
| 16 | 87-056-050-01 | | Safety instruction (U model only) | | 1 | |
| 17 | 87-032-845-01 | | Siemens plug (H models only) | | 1 | |
| 18 | 87-034-978-01 | | Connection cord CW-254 BSK | | 2 | |

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